Atari Classics

Volume 4, Number 1

January/February 1995

postmark 4/22/95 Received 4/26/95

FOR THE DEDICATED 8-BIT USER

Quiz—

There was no Volume 3, Number 4 (or 5 or 6) and no Disk because:

[1] We're very inefficient.

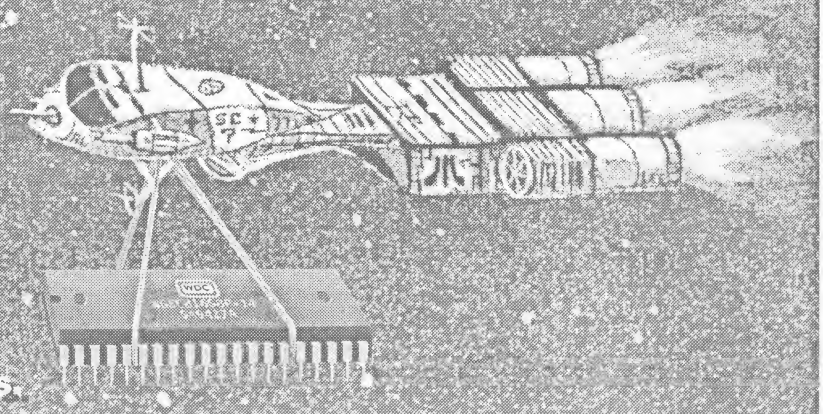
[2] The editor decided to have surgery instead.

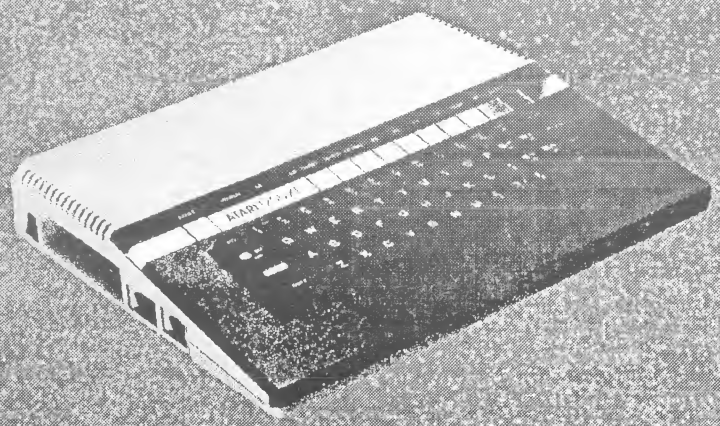
[3] We were looking for the 8-Bit Alchemist.

[4] Our disk editor retired due to medical problems.

[5] All of the above.

[6] None of the above.





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Atari Classics

Volume 4, Number 1

January/February 1995

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Atari Classics is published 6 times a year by Atari Classics, 5507 Langford Court, Concord, CA 94521-1614. Second class postage pending at Alameda, CA. POSTMASTER: Send address changes to Atari Classics, 5507 Langford Court, Concord, CA 94521-1614.

SUBSCRIPTION PRICES: One year is $25.00 in USA, $30.00 in Canada, $32.00 elsewhere. Foreign subscribers may receive Air Mail delivery for an added fee.

BACK ISSUES, if available, may be purchased for 1/5 the price of a yearly subscription.

ARTICLES, REVIEWS or other material may be submitted for publication directly to the appropriate editor or to Atari Classics, 5507 Langford Court, Concord, CA 94521-1614 or to j.hood9@genie.geis.com. Atari Classics takes no responsibiliy for return of submissions but will pay $25.00 for major feature articles upon publication.

In This Issue

Letters		Page 5
Editorial		Page 6
A-T-A-R-I	Paul Alhart	Page 7
The Garret	Ed Hall	Page 9
Basic Off!	Joseph Chiko	Page 14
Review	M. Bennet	Page 17
Keycode Getter	Bob Hardy	Page 23
The 65816	Bob Woolley	Page 27
TT Touch	Jack Lea	Page 33
Red Faced	Jack Lea	Page 35
Next Issue		Page 39

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Letters to the Editor

Dear AC,
Where are all the 1200XL articles? Get with the program!!
R.W. Alameda, CA

Well, our readers have spoken..... I guess more 1200XL stuff is required.

+++++++

Dear AC,
Where the hell is AC???
B.P. Fraser, PA

Right there in yer hands!

+++++++

Dear AC,
For Bob's Auxiliary Processor..... Please (beg...beg), don't do anything to it so us PAL 8-bit owners don't get a look in.
A.A., Bristol, England

Fortunately, a big - time European user, Nir Dary, has donated a PAL 800XL to the Cause. This will provide us with a test vehicle to insure compatibility. Now, there is NO excuse. Thanks, Nir!

+++++++

Dear AC,
You have not received an Atari Classics since Vol.3/ No.3 because:

A. It probably got lost in the mail
B. We ran into publishing difficulties and will mail about _____.
C. We took the money and left the Country.
N.D. Chugiak, AS

Jim, of course, checked 'C' and mailed this readers inquiry postcard...

+++++++

Dear AC,
As my first hardware hack, I tried installing Charles Cole's Super Video detailed in volume 2, number 4 issue of AC. After following all the directions explicitly, I cannot determine any difference or improvement in picture quality....
M.B. Lexington, SC

Have not tried a 130XE Super Video, myself. Anybody? The 130XE video output is already very good - I would expect that only some monitors would benefit from the upgrade. A TV, not at all.

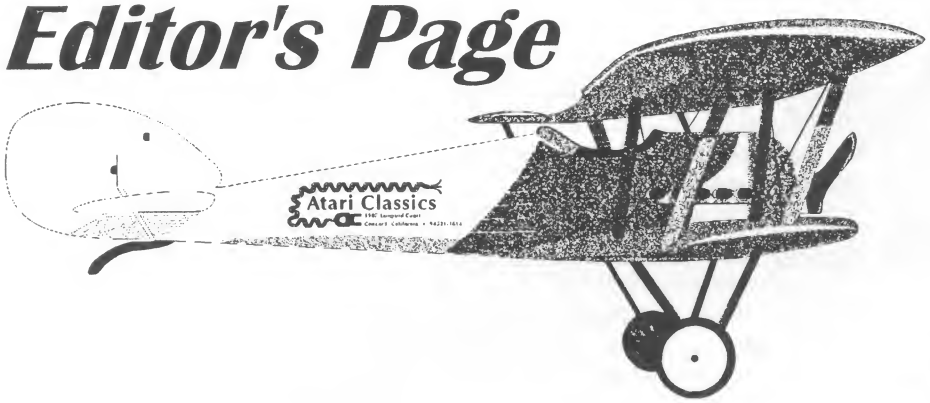
Wanted:
COMPUTEREYES and PARTY-WARE software. Contact Jim Wiker 240 Morgan Dr. Leola, PA 17540 GEnie: J.WIKER

+++++++

Dear AC,
Things I'd like to see:
*Anything on hardware hacks...
*Could anyone get Bill Wilkinson to write a few articles?
*Hard-core computer stuff: actual code/tutorials on data compression, cryptography, sorting, interpreters, compilers, etc.
*A for-real 'C' column would be great.
*No, or very little, computer pabulum! I've got to believe that the majority of your readers are going to be 'hard core' users that are intermediate to advanced.
L.W. Mooresville, IN 46158

Strange that you should ask about Bill W. Mike Hohman has been talking to him on Internet! I would also love to see him in print here. All we need is the magic word. I'll ask.. As for the makeup of our readers, if we limit the scope of our offerings and leave out the new users or game players or any segment of the possible market, we not only lose the benefit of their input, but their support as well. Your estimate of our readership will then become a self-fulfilling prophecy. We have been consumed by production and distribution tasks so far. As soon as time permits, balancing the content can take priority.

Editor's Page



Still in the Race

Well, I don't need much intuition to assume that all you readers are wondering what has happened to AC lately. Actually, it must be a sign of your past experiences that so few of you have cranked up the old AW cart and rattled our cage. We must be a hard - core group to be so patient. Anyway, our leader, Jim Hood, has had major surgery on his neck to remove a malignant tumor. The results of the operation were positive, to the extent that such things can be, and we are all optimistic of the long term prognosis - maybe a little too optimistic of the short term, however. Although he has made steady improvements, Jim is starting 6 weeks of daily radiation treatments today, which will negate some of his progress since the surgery.

Like a deer in the headlights, the 'C' word has frozen both staff and family. Your first reaction is to deny the severity of the situation and set expectations that modern medical care will swiftly and decisively exorcise the evil demon. Jim will be back, good as new, in no time. The reality is that Jim is better and on his way towards normalization, but it is a long, difficult journey. His speech has been affected by the tissue trauma in his throat as has his ability to swallow. So, for the time being, it's liquids thru a tube and a raspy voice. It's still old Jim behind the voice - nothing wrong in the cranium, just another adjustment as we get older.

So, after much hesitation, we shall continue as best we can. Jim is still as active as possible, but much of his artistry will be lacking in the next few issues. The editing will be substandard. The layout will be less appealing. But, the content will be essentially the same since we continue to receive submissions from 8-bit users everywhere. Jim did do our cover this month as well as the masthead page layout. It shows, doesn't it? I suppose if I weren't such a big fan of Jim, AC would have been less difficult to restart. AC shall continue. By the way, Jim just loves opening mail from Atari folks. He really appreciates the letters he has received - thanks!

The plan is to publish Number 1 in March, Number 2 in April and Number 3 in May. This will put us back on track, date - wise. There will be no Volume 3, Number 6 (November /December 1994) issue. We don't want the issue quality degraded too drastically, so don't get nervous if we miss these dates by a small margin. Our crystal ball is still being programmed .. .. Good thing it's under warranty.

Bob Woolley
Editorial Director
Atari Classics

ADD SOUND TO YOUR MONITOR (& other Neat Stuff)

Paul Alhart

When I found a good deal on a composite video monitor at a garage sale, I jumped at it. Only after I got home did I realize it contained no audio circuitry. What to do? I could have run the audio to my home stereo amplifier, but that was in another room and normally being used by my wife for such mundane tasks as playing music. After considering all my options, I decided to add the audio circuitry to the monitor myself. This turned out to be quite easy and inexpensive.

No, I didn't end up with a 100 watt Hi-Fi, Dolby quality stereo sound system. What I did get was audio comparable to that of most small TVs and, as a bonus, the monitor can now be used with a VCR (*actually, mine sounded very nice with a good speaker - the specs on the LM386 are quite good! - ed.*).

Details

The following article explains how to add audio to your monitor. You will need the following parts: (They are all available at Radio Shack for about $10.00. If you can scrounge a speaker from a dead radio, you should be able to get by for under $5.00.)

- LM386 audio amplifier IC
- 10K ohm potentiometer
- 220uf @ 35V capacitor
- 8 Ohm speaker
- chassis mount RCA jack
- 2ea. 12" lengths of shielded audio cable

NOTE: The audio circuitry requires DC power that is between +4 and +16 volts and assumes that you will be able to obtain this power from your monitor.

Of course, you will need a soldering iron, some solder and some hook-up wire. I etched a PC Board to mount my IC, but you could glue the IC to the back of the speaker and solder the components directly to the IC or an IC socket, if you prefer.

Directions

So, let's get started. Refer to the schematic in figure 1. as we proceed.

Step 1: Remove the case from your monitor and find a suitable location for the speaker. It doesn't have to face forward and should be away from the high voltage circuitry of the monitor. *(if you don't recognize the high voltage section, replace the cover and forget the whole thing! ed.)*

Step 2: If necessary, drill holes for the sound to come out, then mount the speaker.

Step 3: Using a multitmeter or a schematic of your monitor, locate a source of DC power between +4V and +16V as referenced to chassis ground.

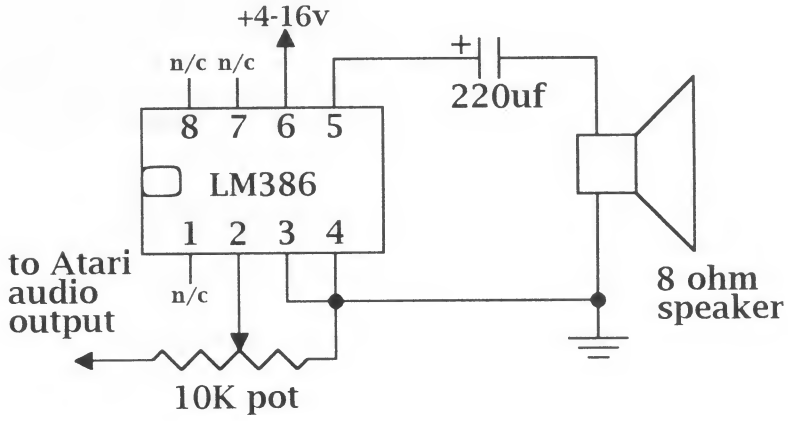


Figure 1.

Atari Classics Jan/Feb 1995

Step 4: Using hook-up wire, connect this DC power source to pin 6 of the IC.

Step 5: Connect one end of each of the shielded audio cables to the 10K pot. The two shields should both connect to one of the pot's end terminals. One center conductor should connect to the wiper or center terminal and the other center conductor to the remaining terminal.

Step 6: Mount the pot in a handy location on the monitor. This will be your volume control.

Step 7: Mount the RCA jack on your monitor and connect the shielded audio cable that goes to the pot's upper pin to it. The center conductor connects to the center pin of the jack. The shield connects to the jack's ground solder tab. This jack is where your Atari's audio output will be plugged in.

Step 8: Connect the 220uf capacitor between pin 5 of the IC and one of the speaker terminals. Be sure the + side of the capacitor is connected to pin 5.

Step 9: Connect the other speaker terminal, the remaining audio cable shield, as well as IC pins 3 & 4 to Chassis Ground.

Step 10: Connect the remaining audio cable center conductor to pin 2 of the IC.

Step 11: Put your monitor back together and you're ready to test.

NOTE: If your volume control seems to work backwards, reverse the wires going to the pot's two end terminals.

IBM COMPATIBILITY?

How many users do you know that have given up the Atari for IBM compatibles because they just couldn't easily move files between their Atari at home and the PC they were forced to use at work? I have felt the PC tug many times myself - wouldn't it be nice to be able to work on my A-T-A-R-I columns during lunch (my hours) and then bring the disk home to finish editing as an Atari file?

The old way

I used to send my files to a local BBS where the SysOp would then put them on an MSDOS disk for me to take to work. To get them back to my Atari, I would have to give the SysOp an MSDOS disk that he would then make available for me to download from his BBS. Sure it worked, but it could sometimes take a week or more to get my files from one machine to the other.

But now...

Thanks to the programming genius of Charles Marslett, I just carry my Atari disks to work with me and pop them into the PC's floppy drive.

It's true!

With Charles' great utility, "UTIL.EXE", the PC's floppy drive is configured to act as an Atari double density drive. Your PC can then format Atari disks as well as read & write files to them. Files are copied between your Atari disk and the PC's hard drive. You have the choice of a "straight copy" or automatically translating to or from ATASCII. Once the files are on the PC's hard drive, you can boot WordPerfect or whatever software you want and go to it. When done, use "UTIL.EXE" to copy the files back on your Atari disk. Although Atari programs won't run on you PC or visa versa, you can download PC programs from any BBS with your Atari and they will run on your PC after being copied to the hard drive.

You need

Your Atari needs to have a true double density drive to use this program. A stock 1050 dual density drive won't do. If using a modified 1050, do not use the Ultra Speed sector skew on your transfer disk.

Problems

There can be problems due to head alignment. I've found that if I first format the Atari disks on the PC drive, I have fewer problems here.

Sources

One source for this program is CompuServe. It is in the IBM file section and is named ATARIO.ZIP. The ZIPed file contains the program, a .DOC file, and the source code. Also, I will try to get this program put on a future AC Disk *(I think it is on this disk - ed.)*

Get a copy and LOSE the Atari/PC BLUES!

THE GARRET:

TV BINGO

by **Ed Hall**

It all began when a couple of shifty-looking characters just strolled into my store. I figured them for shoplifters right away. One guy wore a trenchcoat with a fedora pulled low over his forehead so you couldn't see his face. The other guy was a short little dude in a goose-down jacket that had seen better days. They got as far as the automotive section before I intercepted them.

"May I help you?" I asked politely.

The fellow in the trenchcoat lifted his head so that his eyes were no longer hidden by the brim of his hat. He said, "We heard you sell computers."

I felt my eyebrows shoot up. I could imagine these two filling their pockets at the nail bin, or sliding lengths of rope down the legs of their trousers. But computers? No way!

"Over there," I said cautiously. "Between the plumbing supplies and the bib overalls."

The little guy led the way. He had skinny legs that ended in greasy skidoo boots. He clomped down the aisle toward the computers, leaving smudge marks on the floor behind him.

I hurried after them. "Did you have anything specific in mind?"

The guy in the hat mumbled something. I caught the words "case" and "important".

"I agree with you one-hundred-percent," I said eagerly. "Some people are so concerned about a computer's innards that they completely overlook the case. Big mistake. That's why I offer custom paint-jobs."

This is a great BINGO game, but it is just too long to print it in AC and it requires things like COVOX files to run. Any non-disk subscribers can write to us for a free copy of TV BINGO.

Please include a blank disk and a stamped, addressed return envelope.

They stopped in front of a standard XE with flames spray-painted along the sides. The little guy tapped the keyboard a few times, then nodded at the guy in the hat and said, "This'll do."

"A wise choice," I enthused, "and economical too. The price is only--"

The guy with the hat said, "Whatever it is, we can't afford it. What we had in mind was, maybe we could just borrow it for a while."

My mouth fell open. "Borrow it?"

"Let me introduce myself. I'm Dan Diamond, and this is my associate, Freddie Tapedeck. Perhaps you've heard of us?"

I shook my head.

"We're private investigators and we're working on a case. A big one. We're gonna blow the lid off one of the nastiest scams around. Trouble is, Freddie here needs a computer. You lend us one and we'll cut you in on this caper."

I frowned. Business hadn't exactly been booming lately, what with the recession and all. So I said, "What's that work out to in dollars and cents?"

Dan stroked his chin. "Let's take it one step at a time. First of all, we make you a partner, okay? You'll be our...um..."

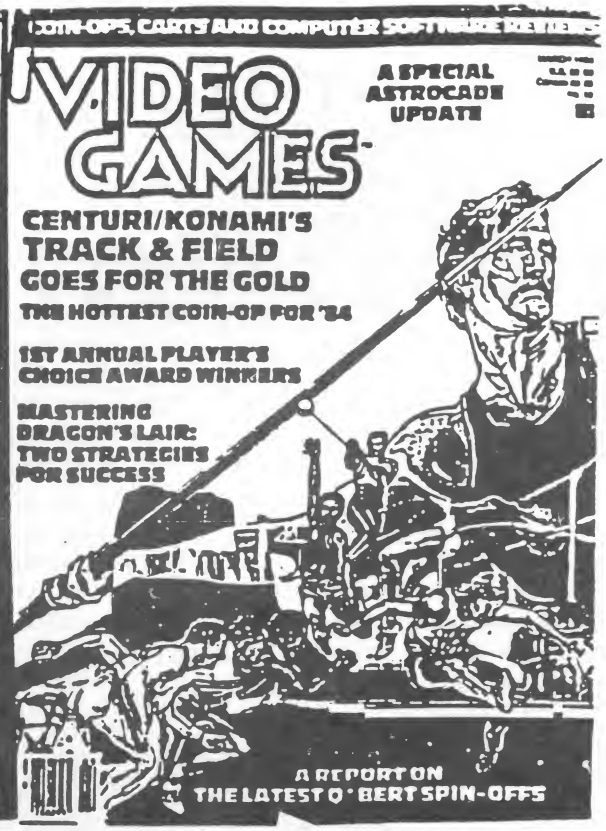
"Business manager," said Freddie.

I nodded warily. "Okay."

"Then we rent the computer from you. How much would that set us back?"

"Fifty bucks a day."

Video Games



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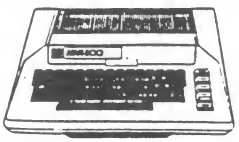

Nintendo

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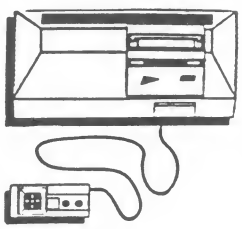
Sega



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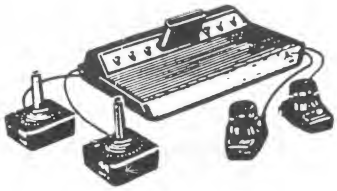

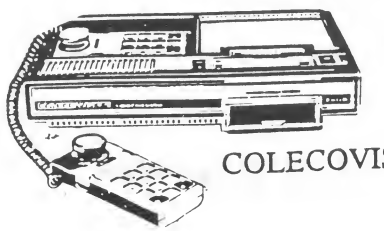

COLECOVISION

INTELLIVISION

"You sure?" Dan asked with a wink. "I'd have guessed at least seventy-five."

"Er, right, that's what I meant to say. Seventy-five."

"All right. So every day we have the computer, you, as our business manager, collect the $75 you're owed for the rental. How's that sound?"

I closed one eye and tried to imagine how that would look on my accounting ledger. Then I gave up and said, "What's the case involve? Blackmail? Espionage? Drug-running?"

Dan solemnly shook his head back and forth, then looked around furtively before leaning closer and whispering, "Much bigger than that. We're talking bingo."

At first my reaction was the same as yours: disbelief. Then they took me to smoke-filled bingo parlors which were indistinguishable from opium dens. I met people who made their living playing bingo, and others whose lives had been ruined by it. Soon it became clear that an entire sub-culture had sprung up around the game, and nowhere was this more evident than in the popularity of the bingo-callers. The talent. Few could appear in public without being mobbed by autograph seekers, and all had the same glossy hair, white shoes, and thousand-watt smiles. Invariably, yards of golden chain were looped around their necks, and often the arms of beautiful women.

BINGO WAS HIS NAME

But it was not until Freddie gave me a brief history lesson that I came to understand how this insidious game had infected our society.

It had been created in India by a disgruntled vizier who, unable to tolerate his losses at chess, decided to modify the noble game to his own advantage. He began by reducing the size of a chessboard from 64 to 25 squares, and eliminating all pieces except pawns. When these changes failed to bring about the desired result, the vizier decided his only recourse was to completely remove the element of skill and replace it with luck. He did this by introducing a 75-sided die.

Centuries later the game turned up in the Holy Land at the time of the Crusades, and was carried back to Europe by a band of wily Jesuits, thus beginning the game's long association with the Church of Rome. Legend has it the game's name dates from this period. It seems a certain Pope was so smitten by the game that he ignored his favorite lapdog. So wounded was the beast that it exacted revenge by leaping upon the board and scattering the markers, then running off with the pontiff in hot pursuit, crying the mutt's name: "Bingo! Bingo!"

Early in this century, the Mafioso introduced the game to America, where it became known as the "numbers racket". Later, a sanitized version appeared in Las Vegas under the name keno. In the 1960s go-go dancers in cages made a brief appearance in bingo halls, as well as a new wrinkle in gameplay. Players were allowed to use the same card for more than one game, a variation which did not really catch on till the environmental movement became prominent. This form is known as go-go bingo or eco-bingo.

With the proliferation of state-run lotteries and computerized gambling machines, the next development was inevitable: tele-bingo. Who needs cards and markers and dabbers in the electronic age? Cable companies now invite us to hook up our computers to a TV set and use a joystick to play the game directly on the screen. Bingos are verified electronically by the cable company, where the entire operation is run by a computer program.

But here, of course, is where the scam comes in. Dan and Freddy suspected the software was crooked.

"We've got the program," Dan said, showing me a disk. "All we need is a computer so we can examine the code and confirm our suspicions."

I frowned. "You don't strike me as a computer type."

Dan laughed. "You're right. I don't know a thing about computers. Freddie's the expert."

Freddie grinned at me. I noticed he was missing several teeth.

PROGRAM NOTES

When Freddy began to work, I realized I had under-estimated him. Not only was he determined to reverse-engineer the code, but he also wanted to track down the program's origins. It was real detective work, and not made any easier by the program's design. He muttered

to himself continually as he worked, and at first I thought it was due to hunger, because he kept repeating the word "spaghetti". When I finally brought him a plate of the stuff, he nearly threw it at me. Seems he was referring to the unconscionably large number of GOTOs and GOSUBs in the program. Soon he began referring to the program's creator as "Spaghetti Head".

It didn't take long for him to discover that the whole thing was built around a very short bingo program from the January 1986 issue of ANTIC. But when he came to the P/M routine, he faltered.

"Tom," he muttered, his smudged fingers fluttering over the keyboard. "This is Tom's work, I'm sure of it."

But Tom who? The obvious answer was Tom Hudson and the P/M routine he had published in issue 10 of Analog. But after much hair-pulling Freddie discovered this was not the case. For some reason Tom Hudson's routine corrupted values which were stored in the array CARD().

Suddenly Freddie exclaimed, "Got it! Tom Halfhill!"

"The hobbit?" I asked.

"No, no, the editor of COMPUTE! magazine."

Freddie was right. Whoever the programmer was, he (or she) had used Tom Halfhill's "Atari P/M Graphics Toolkit" which appeared in the same great issue of COMPUTE! (March 1986) as "Atari Speedcalc." The routine is dead simple to use, and automatically looks after all that crazy mystical stuff, like clearing memory and lowering ramtop.

The biggest clue to the programmer's identity was in the snippet of digitized speech used by the program. It was facilitated by a device called Covox Voicemaster Junior. However, Freddie discovered that the actual code had been modified by Matt Ratcliff, as described in the May 1989 issue of ANTIC.

The part of the program that Freddie was most interested in was the random number generator. Its basic form is:

```
190 N=INT(RND(0)*75)+1
192 IF N=G(N) THEN 190
194 G(N)=N
```

You can try it out by erasing lines 176 and 182-188 from the program, and replacing line 190 with the one shown above. The only problem with this simple approach is that, when there are only a few numbers remaining to be called, the program takes a while to find them, sometimes a couple of seconds or more. The reason this is a problem is that the joysticks can't be used while the program is selecting a number.

The programmer tried to get around this problem by keeping track of the numbers called in each of the five columns. When all 15 numbers in any column have been called, the program will no longer search for numbers in those columns (line 184). However, for some reason, the numbers seem to be generated in clusters. It was this characteristic which first alerted Dan and Freddy to the possibility that the code was crooked.

Freddie, being the hacker he is, quickly put together a routine which neatly solves both problems. BINGO.LST randomly generates all 75 numbers BEFORE the game begins and stores them in the array G2(). Then, during the game, the program simply calls up the next number from G2(). The waiting time is virtually nil. The sole problem with Freddie's solution is that it adds significantly to the initialization period.

Players using this routine will still notice a slight interruption if they're using their joystick when a number is generated. However, most of this delay is due to the sound which accompanies the appearance of a new number. To further reduce the delay, delete GOSUB 108 from line 212.

Of course, Freddie's routine opens a thorny issue. Is such a routine ethical? What if it fell into the wrong hands? Unscrupulous people could easily subvert it to their own advantage.

Dan and Freddie never did tell me how the case turned out. Last time I saw them, Dan was wearing a new trenchcoat and Freddie was driving the sportiest snowmobile you ever saw. At least they didn't stiff me; I made sure I paid myself for the computer rental.

I'm kinda glad I'm not mixed up with them any more. Dan and Freddie are a couple of bad apples, that's for sure.

- the end -

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CARTRIDGES: PRODUCTIVITY

Assembler Editor	9
Atari Lab Light Module	19
Atari Lab Temp. Module	19
Atari Light Pen	19
Atari Logo	7
AtariWriter	19
Basic	10
Basic XE	29
MicroFiler	10
Music Composer	10
Pilot Programming Lanuage	7
Sky Writer	7
Smart Terminal	1
States & Capitals	5
Telelink	1
Video Easel	7

CARTRIDGES: GAMES

Adventure Creator	9
Archon	7
Asteroids	7
Ball Blazer	7
Baseball	7
Basket Ball	7
Battle Zone	7
Blue Max	7
Buck Rogers	7
Caverns of Mars	7
Centipede	7
Computer War	7
Congo Bongo	7
Crossbow	7
Dark Chambers	7
David's Midnight Magic	7
Decathalon	7
Defender	7
Deluxe Invaders	7
Demon Attack	7
Desert Falcon	7
Donkey Kong	7
Donkey Kong Jr.	7
Eastern Front	7
E.T.	7
European Scene	7
Final Legacy	7
Food Fight	7
Football	7
Frogger	7
Galaxian	7
Gato	7
Grid Runner	7
Hardball	7
Humpty Dumpty & Jack & Jill	7
Hickory Dickory Dock	7
Journey to the Planets	7
Joust	7
Jumbo Jet Pilot	7
Jungle Hunt	7
Kickback	7
K-razy Antics	7
K-razy Kritters	7
Lode Runner	7
Logic Levels	7
Major League Hockey	7
Millipede	7
Miner 2049	15
Missile Command	7
Moon Patrol	7
Monster Maze	7
Ms. Pac-Man	7
Necromancer	7
One-On-One	7
Pac-Man	7
Pengo	7
Pit-Stop	7
Platter Mania	7
Pole Position	7
Pool 400	7
Popeye	7
Protector II	7
Qix	7
Rescue on Fractalus	7
Return of the Jedi	7
River Rescue	7
Robotron 2084	7
Silicon Warrior	7
Snooker & Billards	7
Space Shuttle	7
Star Raiders	7
Star Raiders II	7
Star Trek	7
Star Wars	7
Submarine Comm	7
Super Breakout	7
Super Charger	7
Tennis	7
3-D Tic-Tac-Toe	7
Wizard of Wor	7

DISKS: PRODUCTIVITY

Atari CX85	5
Atari Translator	5
Atari World	1
AtariWriter 80	19
AtariWriter Printer-Driver	5
Awardware	19
Backup Master	5
Bankstreet Writer	5
B-Graph	7
Bond Analysis	1
Book Keepers Data Base	5
Book Keepers Data Entry	5
Book Keepers Reporting	5
Book Keepers Simple DB	5
Business Package	1
Cardware	7
Chop Suey	1
Compuserve Vidtex	5
Crystalware	5
Data Manager	5
Data Perfect	5
Diskey	7
Disk File Manager	5
Disk Wizard	7
DOS 2.5 w/Docs	10
DOS XE	5
DOS XL	5
Electronic Checkbook	5
Family Finances I	6
Family Finances II	6
File Manager 800	5
File Manager +	9
Financial Strategies	5
Forms Generator	5
Forth Language	5
French Vocabulary	7
Geometric Designs	5
Grammar	7
Graphic Generator	5
Graphics Library	7
GT Date Manager	7
GT Estate Wordprocesser	7
GT Spread Sheet	7
Algebra	5
Practice Test	5
Reading	5
Vocabulary	5
Word Problems	5
Heartware	5
Home Accountant	5
Home Filing Manager	5
Home Pak	5
Home Word	5
Instant Programers Guide	5
Inter Lisp	5
Japan Scenery Disk	5
Jingle Disk	5
Krell's SAT Prep	7
Kyan Pascal Software	5
Letter Wizard	5
Lightspeed C	10
Macro Assembler	19
Magniprint	5
Master Type	10
Mega Filer	5
Mega Font	5
Mega Font II	5
Microsoft Basic II	7
MicroPainter	5
Mind Tuner	5
Mode Mixer 1&2	5
Money Manager	5
Movie Maker	5
Music Construction Set	7
Music Painter	5
Music Studio	9
Music Writer	5
My First Alphabet	7
Newsroom, The	15
OS/A+	5
Paint	5
Paint Master	5
Page Designer	5
PaperClip	19
Practice Tests Diagnosis	5
Print Kit	19
Print n Draw	5
Print Power	5
Print Shop Companion	19
Printer Driver	5
Professor I.Q.	5
Report Writer	5
Rubber Stamp	7
S.A.M.	15
Screen Printer	5
Smart Terminal	5
SpartaDos	15
Speedread	5
Spell Wizard	5
Stock Analysis	5
Stock Charting	5
Success With Math	5
Super Database	5
Super 3D Plotter II	5
Syncalc	15
Synchron	15
Syntile +	19
Syntrend	15
SX Express	15
Tax Advantage	5
Technicolor Dream	5
Tele Communications	5
Text Wizard Ver. 1.3	5
Timewise	7
Typesetter	10
U.S. Geography	9
U.S. History	9
Visicalc	15
Vocabulary	9
Word Flyer	5
Word Race	5
XE Term	9
Your Personal Net Worth	7

HARDWARE

Atari 800XL (64K)	59
Atari 800 (48K)	39
Atari 1200XL (64K)	49
Atari 65XE (64K)	49
Atari 130XE (128K)	99
Atari XE GM SYS (64K)	59
Atari XF551 Disk Drive (360K)	149
Atari 1050 (127K)	99
Atari 810 (90K)	59
Percom SS/SD (90K)	79
Percom SS DD (180K)	99
Indus GT SS/DD (180K)	129
Atari 410 Cass Drv	5
Atari 1020 Plotter	19
Atari XM301 Modem	19
Atari 1027 Printer	39
Atari 850 Interface	49
ICD P:R. Connection	49
Color Composite Mon.	79
XE-XL Power Supply	27
1050/800 Power Supply	15
1027 Power Supply	27
ATR8000	79
ICD MIO 256K	99
Koala Pad (W/SW)	24
Atari Touch Tablet	24
Atari Light Pen	24
MPP 1000E Modem	5
Atari 1025 Dot Matrix	49

BOOKS

Atari Assembler, The	7
Atari Basic - Teaching Guide	7
Atari Basic XL Edition	7
Atari Games & Recreation	7
Atari Logo Reference Manual	7
Atari Pilot For Beginners	7
Atari Prog. w/ 55 Programs	7
Atari Sound & Graphics	7
Atari Sourcebook, The	7
Atari XE User Handbook	7
Basic XL For Atari	7
Best Atari Software, The	2
Compute!'s 1st Book of Atari	7
Compute!'s 1st Book Games	7
Compute!'s 1st Book Grfx	7
Compute!'s 2nd Book of Atari	7
Compute!'s 3rd Book of Atari	7
Compute!'s Atari Vol. I	7
Computer Tutor	7
Designs From Your Mind	7
Free Software For Your Atari	2
Games For The Atari	2
Inside Atari Basic	7
Inside Atari Dos	7
Mapping The Atari	15
Player Missle Grfx in Basic	7
Your Atari Computer	7

DISK GAMES

Ace of Aces	7
Action Biker	7
Adventure Series	7
Adventure Writer	7
AE	7
Agent USA	7
Age of Adventure	7
Alternate Reality	7
Anti-Sub-Patrol	7
Archon	7
Archon II	7
Assault Force	7
Assault on the Astral Rift	7
Astro Chase	7
Aztec	7
Aztec Adventure	7
B-1 Nuclear Bomber	5
Baja Buggies	5
Ball Blazer	7
Ballyhoo	5
Battlehawks 1942	5
Battle of Antietam	12
Beach-Head	7
Beach-Head II	7
Beyond Castle Wolfenstein	10
Blade of BlackPoole	5
Blue Max	7
Boulder Dash	7
Bruce Lee	5
Carrier Force	5
Castle Wolfenstein	12
Caverns of Mars	7
Chessmaster 2000	7
Chicken	5
Choplifter	7
Computer Baseball	5
Colonial Conquest	5
Conflict in Vietnam	7
Congo	5
Crossfire	7
Crusade in Europe	12
Cutthroats	7
Cyborg	7
Dimension X	5
Dungeons of Despair	5
Eidolon, The	5
ElektraGlide	5
Encounter	5
Eye of Horus	5
F-15 Strike Eagle	7
Fast Hack'em II	5
Fight Night	7
Firebird	5
Flight Simulator II	15
Forbidden Forest	5
Fort Apocalypse	5
Fortress	5
Frogger	7
Galactic Avenger	5
Galactic Chase	5
Gambler	5
Gateway to Apshai	7
Gauntlet	7
Gemstone Warrior	7
Gettysburg	12
Ghostbusters	5
GI Joe	5
Great Amer. X-Ctry Rd Race	5
Gunslinger	7
Guns of Fort Defiance	5
Hacker	5
Halley Project	5
Hard Ball	7
Hard Hat Mack	5
Hellcat Ace	5
Hellfire Warrior	5
Hitchhiker's Guide	12
The Hulk	5
Imperium Galactum	5
Infantry Squad	5
Infidel	7
Infiltrator	5
Jewels of Darkness	5
Jumpman	9
Jumpman Jr.	9
Kampfgruppe	5
Karateka	7
Kennedy Approach	7
Kikstart	5
Koronis Rift	7
L.A. Swat/Panther	5
Leader Board	7
Leather Goddesses Phobos	12
Lurking Horror	5
Mail Order Monsters	7
Maniac Miner	5
Mask of the Sun	5
Master of the Lamps	5
Masters of Time	5
Match Racer	5
Mercenary	5
Micro Chess	7
Microleague Baseball	7
Mig Alley Ace	5
Mission: Asteroid	7
Missing Links	5
Montezuma's Revenge	5
Moon Shuttle	5
Ninja	5
Ogre	5
One-On-One	12
On Track Racing	5
Operation Whirlwind	5
O'Riley's Mine	7
Pacific Coast Highway	5
Pinball Construction Set	12
Pitstop	7
Pitstop II	7
Poker Tourney	5
Pooyan	5
Preppie	9
Preppie II	7
Protector II	5
Racing Destruction Set	7
Raid Over Moscow	7
Ralley Speedway	5
Rasterblaster	5
Realm of Impossibility	5
Repton	5
Rescue of Fractalus	14
The Return of Heracles	5
Rosen's Brigade	5
Sargon II	7
Sea Bandit	5
Sea Stalker	7
Seven Cities of Gold	10
Shamus	5
Shamus: Case II	5
Silent Service	7
Sky Blazer	5
Solo Flight	7
Sorcerer of Claymorgue Cstle	5
Space Base	5
Space Cowboy	5
Space Games	5
Space Invaders	12
Space Shuttle	7
Speed King	5
Spider Quake	5
Sports Spectacular	5
Spy Vs. Spy	9
Star Fleet I	5
Star League Baseball	15
Star Raiders II	9
Station Fall	9
Stellar Trio	5
Strategy Simulations	5
Strip Poker	12
Stone of Sisyphus	5
Stunt Driver	5
Sultan's Palace	5
Summer Games	9
Super Boulderdash	9
Super Huey	7
Super Space Games	5
Talladega	5
Temple of Apshai	9
Tenth Frame	5
Threshold	5
Tomahawk	7
Top Gunner	7
Touchdown Football	7
Ultima II	9
Ultima III	9
Ultima IV	9
Upper Reaches of Apshai	9
VC	5
Vorrak	5
Wargame Construction Set	7
Warship	5
Wayout	7
Weakon	5
Wizard & the Princess	5
Wizard of Wor	5
Wizardry	5
World of Karate	7
Worms	7
Zork I	9
Zork II	9
Zork III	9

CASSETTES: PRODUCTIVITY

Atari Music I	
Atari Music II	
Basic Psychology	
Biorhythm	
Car Costs Part One	
Demo to Atari 400	
European Countries & Capitals	
French - Conversational	
French (Linkword)	
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Graph It - Bar Charts & Pie Graphs	
Graph It - Polar Plots	
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Great Classics D	
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Intor. to Sound	
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Math Tic-Tac-Toe	
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MicroEd: Tachioscope	
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States & Capitals	
Spanish - Conversational	
Speed Reading, Atari	
Touch Typing	
Trivia Unlimited	
U.S. Government	
U.S. History C	
U.S. History D	
Writing Programs One	
Writing Programs Two	

CASSETTES: GAMES

Adventure 4 Voodoo Castle	
Adventures of Ostwald	
Attack at EP-CYG-4	
Aztec Challenge	
Baja Buggies	
Black Jack	
Block'em	
Blue Max	
Checker King	
Conflict 2500	
Crisis	
Drelbs	
Eastern Front	
Energy Czar	
Frogger	
G.F.S. Sorceress	
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Hail to the Chief	
Hangman	
Juggle's House	
Juggle's Rainbow	
Jumpman	
King Cribbage	
Kingdom	
Matchboxes	
MicroChess	
Midway Campaign	
Mind Boggler's I	
Nautilus	
O'Riley's Mine	
Pacific Coast Highway	
Quarxon	
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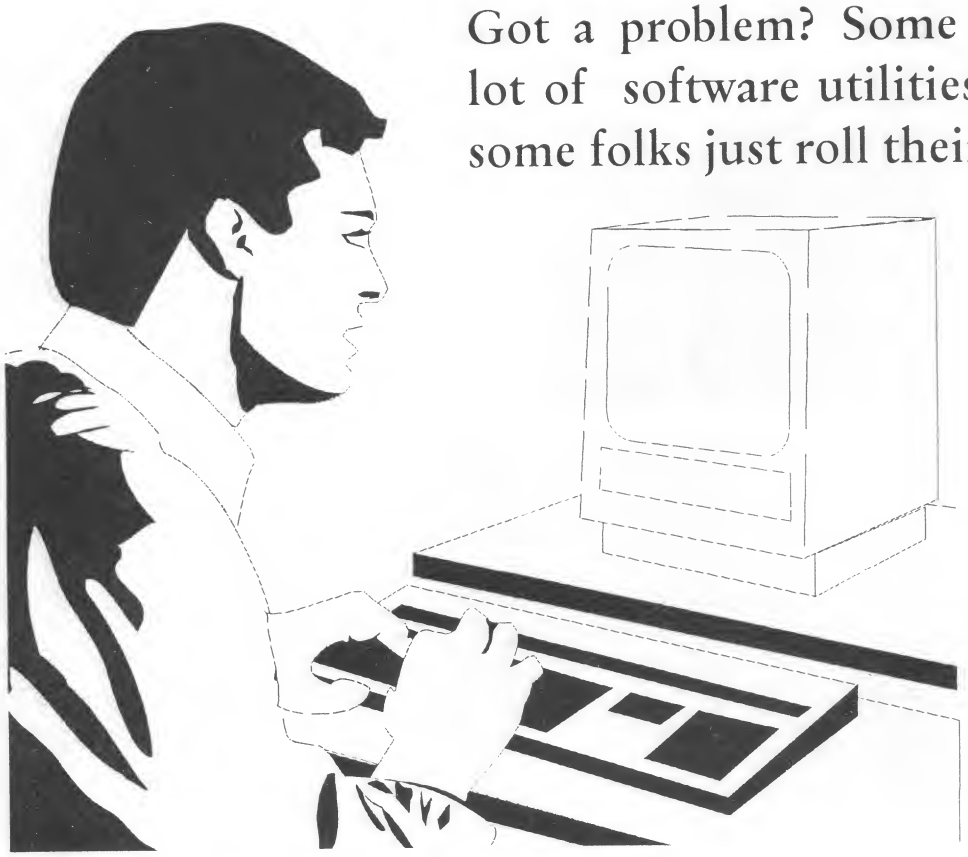

BASIC OFF!

by Joseph R. Chiko

It began many years ago in a different time, in a different place, and for a different reason. It began as a quest to make executing BASIC programs easier for my spouse. The program started out launching simple BASIC programs I had typed in on my then 1200XL.

Over time, the expectations of the program became more grandiose. First, one page of documentation was to be displayed, then an unlimited number of pages. Soon, the program was capable of allowing the viewer to go backwards up to 100 pages of documentation.

Then, the program was pressed upon to launch machine language programs. And, it eventually did this, too. But the magazines that printed the type-in software I loved died off all too soon. I grew tired of trying to write complex BASIC programs and too intimidated and discouraged to tackle machine language.

At that point, I discovered CLSN Pascal and became a coding fool again. I spewed forth solitaire games and utility programs like a volcano does lava and ash. As I attempted my 20th version of solitaire, *Spiderette*, I discovered that CLSN Pascal did not disable BASIC.

So the quest mutated again, and resumed. Donning my well-worn programmer's helmet (used to protect my cranium from the sudden stops it encounters with sold objects such as desk tops and doors and the like), I set out on the quest to unearth the secret of disabling BASIC from within software. It turns out to have been a prudent decision to wear my programmer's helmet for many a late night was spent thumping my head off of the

desk in attempt to make what I had read sink into my all too thick skull.

I scoured old issues of Analog and Antic looking for clues to the secret of turning off BASIC. I dog-eared pages and scribbled cryptic notes in the margins of Mapping the Atari, De Re Atari, and Atari's listing of the 800 OS. I now own a 130XE and, while on a local bulletin board, discovered a listing for the 130XE OS. I even asked for advice from other Atarians on the BBS only to be pointed in directions that I had already explored.

All attempts at disabling BASIC had ended in failure. My goal was to append two programs together. The first would be BASICOFF, the name of the eventual program. It would disable BASIC when executed from either Atari DOS 2.5 or SpartaDOS 3.2d. The appended program would be the Pascal object file. By turning off BASIC the Pascal program could be 8K larger. That would be 8K of additional features. There could be high scores and counters for games won and played and maybe more. But everything I tried either locked up my system or required that RESET be pressed, which would simply return me to DOS.

I was getting desperate and frustrated. The forehead of my helmet was wearing thin and I was in danger of damaging my skull and possibly my brain. I even considered abandoning the quest altogether. But at a club meeting, a friend mentioned that SpartaDOS 3.2d was weird. So, I began to test the fledgling program under DOS 2.5. The program would now turn off BASIC only if I pressed RESET after its execution, but it was not crashing. I returned to the books to see if I had overlooked anything. I went over the recommended list of procedures to disable BASIC that are as follows:

1. Ensure that bit 2 at PORTB is set to a 1
2. Ensure that BASICF is greater than 0
3. Turn the screen off and on to recoup the 8K that BASIC had used

I started to disassemble code only to discover, to my chagrin, that my ALDS disassembler went into a print loop after 10 pages. I was able to learn that some BASIC off programs forced RAMTOP to be 192, so I added this to my code. I also put in a snippet of code to change the color of the screen if the program were successful in disabling BASIC. And, to ease testing requirements, I had the program return to DOS instead of doing the second phase of the load.

Late one night, with the sound of my helmet bouncing off the desk thudding dully throughout the house, I managed to read something between the chapters in Mapping the Atari. It mentioned that cartridge A had to be turned off in order for BASIC to be disabled. With this new code added to the program, BASICOFF worked. I had succeeded! I fired off a short Pascal program to test BASICOFF. The Pascal program simply entered a high resolution graphics mode and displayed the addresses of screen memory to ensure that they were what they were supposed to be.

I was elated! BASICOFF was working. But, my elation was short-lived. The program would not work with SpartaDOS 3.2d so I started dumping SpartaDOS. I was able to deduce that the reason for my scrambled screen was that the program was in the RAM under the ROM chip when the screen display list was setup, resulting in a scrambled screen. SpartaDOS calls a common routine to set and reset PORTB, keeping a copy of the original contents of PORTB in an 8 byte array. I stared at the code for days, going cross-eyed in the process, trying to figure out which of the 8 copies was being used to reset PORTB. Just as I was losing consciousness in a last and perhaps futile attempt to jar an idea loose, I realized that I did not need to know which of the memory addresses to change. All that had to be done was simply to change all 8 values, so that no matter which value SparataDOS used to restore PORTB, it would indicate that BASIC was indeed off.

I had finally and definitely succeeded in wrenching the secret of disabling BASIC from its hiding place. It took me months to figure this out and I now can see daylight though the small hole in the forehead of my programmer's helmet. Perhaps I will remember why I do not like machine language for a long time to come, but I can take solace in the fact that the assembler listing that follows this article may keep some fellow 8-bitter from damaging his brain or ego.

To use this program, type in the code and use your favorite assembler to compile it. Let's assume the compiled object file is BASICOFF.OBJ. I would typically use the following SpartaDOS commands to combine two object programs together:

```
COPY BASICOFF.OBJ GAME.OBJ
COPY PASCAL.OBJ GAME.OBJ/A
```

A similar operation can be done using Atari DOS 2.5. GAME.OBJ will now do a multi-phased load. In phase one, the code of BASICOFF is executed. If BASIC is already off, the screen will not change colors. If BASIC is disabled by BASICOFF, the screen colors will change. In phase 2, the code for GAME.OBJ is loaded with the additional 8k freed up by disabling BASIC available for its use. Now, my large Pascal programs can be launched by the BASIC utility responsible for this task without having to worry about how to handle the exception of programs that require that BASIC be turned off.

```
;@@@@@@@@@@
;@
;@ BASIC OFF . ASM
;@
;@ by Joseph R. Chiko
;@ during July and August 1994
;@
;@ This program was designed to turn
;@ the BASIC cartridge off on a
;@ XL/XE.  The program works for both
;@ Atari DOS 2.5 and SpartaDOS 3.2d.
;@ It may work the SpartaDOS 2.3? or
;@ the new release by FTE of 3.2g,
;@ but as of August 10, 1994, I have
;@ not had the time or desire to test
;@ this.  Perhaps at some future date
;@ I will, but for now I am
;@ satisified with this program's
;@ capabilities.
;@
dosvec = $000a
savmsc = $0058
ramtop = $006a
sdmctl = $022f
sdlstl = $0230
color2 = $02c6
color4 = $02c8
runad  = $02e0
initad = $02e2
memtop = $02e5

;@@@@@@@@@@
;@
;@ I/O Control Blocks
;@  7 blocks starting at $0340
;@  X points to the 1st byte in block
;@
ichid  = $0340 ; index to device name
icdno  = $0341 ; device number
iccom  = $0342 ; command
icsta  = $0343 ; status
icbal  = $0344 ; buffer address
icptl  = $0346 ; put one-byte address
icbll  = $0348 ; buffer length
icax1  = $034a ; aux byte 1
icax2  = $034b ; aux byte 2
icax3  = $034c ; aux byte 3/4 points
               ; to disk sector
icax5  = $034e ; aux byte 5 points
               ; to byte in sector
icax6  = $034f ; aux byte 6


basicf = $03f8

bflg   = $0700 ; boot flag
SDOS   = $0700 ; SpartaDOS
brcnt  = $0701 ; # of boot sectors
SDOSver= $0701 ; SpartaDOS version
pbCopy = $0774 ; portb Copy

crtain = $bffc ; cart a inserted?

reset  = $c2aa

portb  = $d301
wsync  = $d40a

ciov   = $e456


* = $0670

iocb       .BYTE 0

editor     .BYTE "E:", 155

SpartaDOS .BYTE "S"

enterBASICOFF

  CLD

  ;@ is BASIC already off
  LDA portb
  AND #$02
  CMP #$02
  BEQ exitBASICOff

turnBASICOff
  LDA portb
  ORA #$02
  STA portb

  ;@ do the same to basicf
  LDA #$01
  STA basicf

  ;@ ensure that carta isn't inserted
  STA crtain

  ;@ adjust ramtop
  LDA #$c0
  STA ramtop

  ;@ test for SpartaDOS
  LDA SDOS
  CMP SpartaDOS
  BNE turnEditorOff

  ;@ test for version 3.2
  LDA SDOSver
  CMP #$32
  BNE turnEditorOff

  ;@ SpartaDOS 3.2d keeps the last 8
  ;@ values of PORTD starting at
  ;@ $0774, so I am going to ORA all
  ;@ 8
  LDX #$FF
orPortbCopy
  INX
  LDA pbCopy,X
  ORA #$02
  STA pbCopy,X
  CPX #$07
  BNE orPortbCopy

turnEditorOff
  LDX iocb
  LDA #$0c
  STA iccom,X
  JSR ciov
  BPL turnEditorOn
  JMP reset

turnEditorOn
  LDX iocb
  LDA #$03
  STA iccom,X
  LDA #<editor
  STA icbal,X
  LDA #>editor
  STA icbal+1,X
  LDA #$0c
  STA icax1,X
  LDA #$00
  STA icax2,X
  JSR ciov
  BPL changeColors
  JMP reset ; on CIOV error RESET

changeColors
  ;@ change the background color
  LDA #$04
  STA color2

  ;@ change the border color
  LDA #$b2
  STA color4

  ;@ code used when testing BASICOFF
  ;@ to see if I was on the right
  ;@ track
  ;LDA SDOS
  ;CMP SpartaDOS
  ;BNE exitBASICOff

  ;JMP (dosvec)

exitBASICOff
  RTS



* = initad

.WORD enterBASICOFF

.END
```

REVIEW OF "DECODING"

Reviewed by Michael Bennett

A program by H. Jake Olbrich

Decoding is an educational program that teaches spelling and word pronunciation by phonetic sounds. It also includes brief meanings for most of the words it contains. Over 100 phonetic sounds are featured at four levels of word difficulty. A fifth level shows the syllabic structure of the words at the highest level.

Background

Here is a little background information from the help file that can be accessed by the main program:

- This program is based on the book, *Helping Children Overcome Learning Difficulties* by Jerome Rosner, published by Walker Publishing Company. Our program is from the paperback edition, page 159-217.

- [The program] should be used with another person: perhaps an older student or parent. It is primarily an electronic blackboard with a dictionary.

- It is an ideal learning tool for those students with difficulty remembering the long, short and sometimes schwa sound of the vowels and when and where to use them. This program removes the confusion because each sound is used in groups and levels.

- This program is practice and association. The sound to be practiced is always the same in every word. So, there is always one part of every word that they know.

- A little correction and reinforcement at appropriate times, [not] scoring, no timing, no drill, just learning. Mothers of near non-readers have told us they can notice a remarkable improvement after just two or three, one hour sessions per week.

- The program is a short BASIC program that accesses all the word files. I say "all" the word files because they fill up three single density disks! Each disk contains 36 units. The words, their syllables and the dictionary meanings are stored in DATA statements that are ENTERed into the program beginning on line 11100. Someone familiar with the function of DATA statements in Atari programs could easily copy the pattern in one of the files and create their own.

- The phonetic sounds featured in the words provided by the program are:

Disk 1: AT, AP, AB, AND, IT, AG, IN, IG, IB, ICK, OD, OT, OM, EN, ELL, ED, ET, ECK, EST, AD, AS, AM, ACK, AN, IP, ID, IM, ILL, OP, OG, ONG, OB, ESS, ENT, EM, and EB.

Disk 2: ACE, ACT, ADE, AGE, AKE, ALE, AME, ANE, ANG, ANK, APE, ASH, AST, ATE, AVE, AY, EAM, EAT, IDE, IFF, IND, ING, INK, ISH, ITE, OKE, OLD, ONE, UB, UCK, UD, UG, UM, UN, UP, and UT.

Disk 3: ABLE, AI, ALK, ALL, AR, ARE, AW, BULL, COW, DULL, EE, ER, EV, EW, ICE, IGHT, IR, IRE, OA, OCK, OI, OLL, ON, OO, OOK, OR, ORE, OU, OVE, SOW, TION, UE, UFF, URE, US, and USH.

Mechanics

Function keys are used to put more words on the screen and to access the dictionary. Since student users often ask about word meanings, Mr. Olbrich felt a need to add this feature. Definitions of any word containing a particular phonetic sound can be displayed no matter which level has been selected.

Impressions

After I had examined the program for quite awhile, my eight year old son came into the room to see what I was doing on the computer. He sat down beside me and within minutes was pronouncing words far beyond the difficulty I had seen in the vocabulary lists he had been bringing home from school! My opinion of the program is high and I would heartily recommend it to any parent or teacher who has children learning to read.

[Mr. Olbrich has kindly released these programs into the public domain; I submitted them to GEnie for the eight-bit Atari library. If you do not yet subscribe to GEnie, the three-disk series on phonics decoding is available directly from the author for $5. Ed.]

Support is available from the author, a member of the Rockford Atari Computer Club:

H. Jake Olbrich
3693 Renfro Road
Cherry Valley, IL 61016
815-332-5303

[The author and his wife, Terri, have tested and used

these programs in tutoring special needs students, including adult education. My own use of the program proves it to be simple to use, with good documentation on the disk. It's not meant for completely independent study, as you must have a tutor available to check pronunciation; but the immediate access to definitions in the dictionary is helpful. While many educators today stress "whole word" learning, a phonics approach is important for new word-attack skills as well as for students with special needs.

A few comments on the BASIC program: it is easily modified and quite robust, though not "bulletproof". The break key has not been trapped, so an unguided user might accidentally interrupt a lesson. Other than this, hitting a wrong key or entering a non-existent lesson will not cause any problems; errors are well "TRAPped".

The word lists are contained in ENTERed program DATA statements. Each level ends with an asterisk (*), the vocabulary word DATA ends with two asterisks (*,*), and dictionary words and definitions end with "END,AAA". By typing in BASIC DATA lines and LISTing them to disk you could add your own words and definitions, or even create lists for a foreign language, which Mr. Olbrich has begun implementing on disk #3.

Thank you, Mr. Olbrich, for making these available in the public domain. Ed.]

Review of "Elements of Chemistry"

Reviewed by Michael Bennett

A program by Barton Bresnik

Elements of Chemistry is a drill and practice program for the Atari that is useful as a basic review of the elements in the periodic table. Written in BASIC with some machine language routines to speed things up, *Elements* is a straightforward approach to the electron configuration, mass, and position of the elements in the periodic table. It also calculates the molecular mass of a compound. *[The membrane keyboard of the Atari 400 might make this useful in the chemistry laboratory. Ed.]*

Menu - view

The menu gives you three choices. You may choose to view elements individually as to their symbol, atomic number, atomic mass, or electron configuration (including the s, p, d, and f orbitals).

Menu - quiz

You may also choose to take a quiz on your knowledge of the positions of the elements on the periodic table. The computer chooses one element at random and then you must type the symbol of any adjacent element. This process continues as you wind your way across a nice representation of the periodic table for two minutes. A bonus round may be awarded in which you are asked to list the members of certain families, such as the halogens or lanthanides.

Menu - mass

The third feature of *Elements* is a molecular mass function. You may enter the formula of any compound and the program will display how to find the molecular mass of that compound. The formula you entered is also displayed with true subscripts in a sharp looking format. The computed mass is shown at the top of the screen.

Drill

Elements of Chemistry is a good program for drilling the locations of the elements in the periodic table [which shows chemical relationships] and for showing the user how to figure molecular masses. It would make a useful addition to any chemistry curriculum or a home collection for a family with budding chemistry students.

Shareware

It is available as shareware (if it's useful to you, a $5 donation is requested) from the GEnie eight-bit Atari library as file #5805, ELEMCHM2.ARC, or from the author:

Barton M. Bresnik
555 Ware Street
Mansfield, MA 02048-2925

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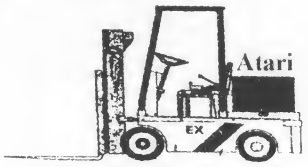

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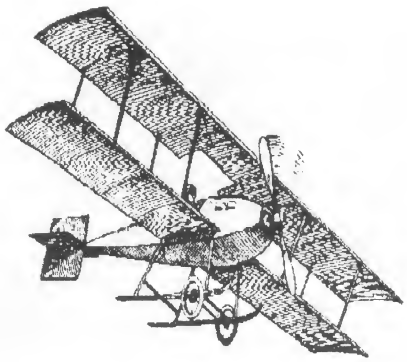

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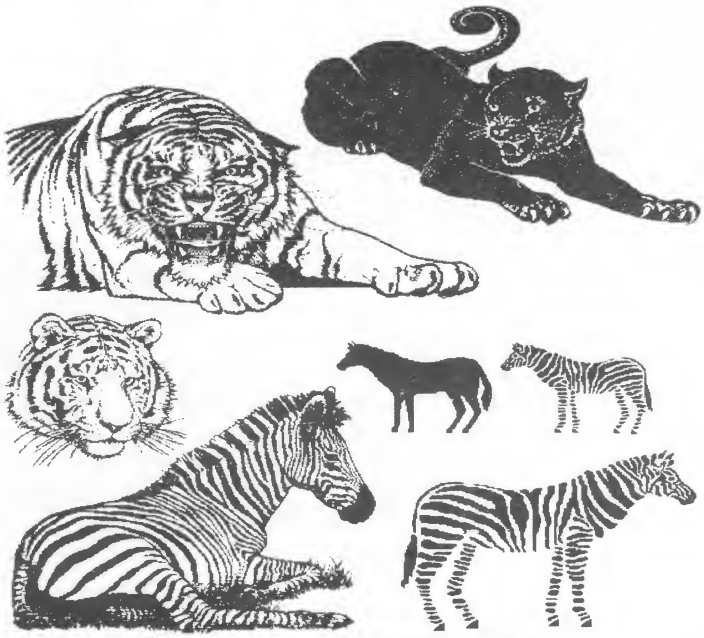

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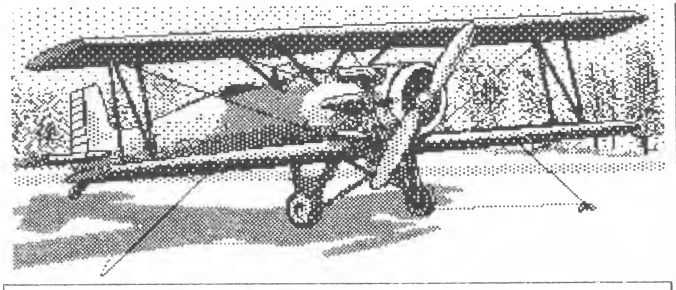

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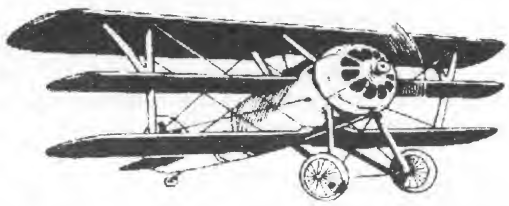

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Sometimes, information is not free - you have to work for it!

KEYCODE GETTER

by Bob Hardy

Those of us who enjoy our "power without the price", our "computers for people", or in other words, our 8-bit wonders, hate to admit that there is anything wrong with Atari... but there have been a few moments when it couldn't be helped. There were bugs in Atari BASIC (Revisions A and B) that could lock up the system hopelessly, causing you to lose anything you had in memory at the time.

The Assembler/Editor cartridge (Rev. A) and its manual were another example... the cartridge got severely confused whenever you tried to trace or step through a binary program and encountered a "CPY #" command. Atari once sent me an errata sheet for the manual -- 11 pages long!

I have discovered another problem area, and it came from a most unexpected source: the venerable Operating System User's Manual!

This often overlooked, almost secret document contains lots of useful information, especially for the advanced programmer. Page 185, in Appendix F, shows a table of keyboard codes for ATASCII characters. This information does not appear in any other publication I know of... not "De Re Atari", nor "Your Atari Computer", nor "Mapping The Atari", nor any other of my Atari bibles. And guess what, campers... it's wrong.

In short, there IS no authoritative place to look up keycodes. I'm not talking about ATASCII codes, or the internal codes used when you poke a character directly into screen ram. I'm talking about the codes that appear in location 764 when a key is pressed. If you PRINT PEEK(764) when no key has been pressed, you get 255, and you can POKE 764, 255 to clear the keypress register. This is fairly well documented, but what about when a key HAS been pressed? According to the Operating System User's Manual, a lower-case "a" keystroke should produce $3F (63), and it does, as does an upper-case "A". But according to that same publication, SHIFT-A should yield the same value... and it doesn't. It also says that CTRL-A yields $3F: it also doesn't.

I could put together a list of all possible values and the keystrokes they represent, but such lists are born to get lost, or to be in the single most unlikely place when you are in the heat of a machine-language programming binge. Instead, I have created Keycode Getter. It runs on any 8-bit Atari with at least 32K or so, from the 400 onward to the 130XE.

How it works is very simple. You do a binary load from DOS with no cartridge present, and press START after reading a little introductory text, and then press a key. What it does is give you the ATASCII character (even "unprintables" like TAB and RETURN), the decimal and hex number for that character in ATASCII, the decimal and hex number for that character in internal code (screen code), and the decimal and hex number for the raw keyboard code, such as can be read from location 764.

Keycode Getter works with combination keystrokes too, or at least, with the combinations that actually produce a character. This excludes SHIFT-CONTROL-A, but includes inverse CTRL-comma, for example. The main purpose of this program is not for such obscurities, however. It is to make the common, ordinary codes accessible, the ones that you might very easily want to use in programming. You may want to see the codes for lower-case or inverse characters anyway. If so, you must press the Inverse key or the CAPS key for each letter, as the program resets the K: device for all capitals, non-inverse, after each completed character. Just for your reference, some keys that WON'T return anything are:

SHIFT-CTRL-A
SHIFT-CTRL-B
SHIFT-CTRL-C
SHIFT-CTRL-J
SHIFT-CTRL-K
SHIFT-CTRL-L
SHIFT-CTRL-V
SHIFT-CTRL-X
SHIFT-CTRL-Z
SHIFT-CTRL-;
SHIFT-CTRL-+
SHIFT-CTRL-*
CTRL-1
CTRL-4 through -9
CTRL-0
BREAK
SHIFT, CTRL, CAPS or the Inverse
(Atari) key when with no other key

There is no doubt about the accuracy of the numbers the program gives you, since all but the keyboard codes can be checked in a number of other places, and the keyboard codes themselves are taken directly from the OS register known as CH1. It would be beyond my means to fully explain the significance of CH1 here, but it is discussed in Mapping The Atari... let's just say that it contains the keyboard code of the last key accepted as input by the K: device.

So when you want your program to accept keyboard input, like for a menu selection, and you don't want to use an error-trapped "get a key" IOCB routine... or maybe you want to redefine keys somehow without having to mess with the character tables, especially since they aren't all in the same places between the 400 and 800 operating system and the 1200XL, 600XL, 800XL, 65XE and 130XE operating systems... you can just leave the K: device open, and look at location 764 for ANY particular keycode you might want. (Don't forget to promptly replace it with a 255, if you want it all to end there!)

I am making the source code available for those who are interested in machine language programming. It is written with MAC/65, but with only a little conversion it can be used with SynAssembler or the Assembler/Editor. There are a few points of interest: the decimal and hex routines could be adapted for almost any kind of number display printout, and there are three separate screen-print routines, each one using a different method!

Feel free to pass Keycode Getter around. In my opinion, most people who write software are users who got unusually frustrated when they couldn't find software written the way they wanted it! I am no exception. I'm anxious to see the software YOU'LL write using Keycode Getter, too!

```
10 ;KEYCODE3.M65
20 ;Rewritten 11/87 by Bob Hardy
30 ;from an original program
40 ;by Bob Hardy
50 ;
60 ;Revision of 4/30/89
70 ;
80 ;
90        .OPT OBJ
0100      .OPT NO LIST
0110      .INCLUDE #D8:SYSEQU.M65
0120      .INCLUDE #D8:MACROLIB.M65
0130      .INCLUDE #D8:GREQU.M65
0140      .INCLUDE #D8:GRAPHICS.M65
0150 ;
0160 ;---------
0170 ; Equates
0180 ;---------
0190 ;
0200 ;IOCB LOCATIONS
0210 ;--------------
0220 ;
0230 ; The IOCBs are the Atari's I/O
0240 ; channels.  They are a 'safe'
0250 ; way to do I/O in that they are
0260 ; always compatible and always
0270 ; 'legal'.  The worst you can do
0280 ; with IOCBs is an I/O error.
0290 ; There are no 'illegal' calls.
0300 ;
0310 ;ICCOM = $0342    ;command
0320 ;ICBAL = $0344    ;buf. adr., lo
0330 ;ICBAH = $0345    ;buf. adr., hi
0340 ;ICBLL = $0348    ;buf. len., lo
0350 ;ICBLH = $0349    ;buf. len., hi
0360 ;ICAX1 = $034A    ;AUX1
0370 ;ICAX2 = $034B    ;AUX2
0380 ;
0390 ;OS REGISTERS, ETC.
0400 ;------------------
0410 ;
0420 ; These are too complex to try
0430 ; to document here.  For details
0440 ; see 'Mapping The Atari' from
0450 ; COMPUTE! books.
0460 ;
0470 ;WARMST = $08
0480 BOOT? = $09
0490 POKMSK = $10
0500 ;LMARGN = $52
0510 ;SAVMSC = $58
0520 INVFLG = $02B6
0530 SHFLOK = $02BE
0540 ;COLOR1 = $02C5  ;(709)
0550 ;COLOR2 = $02C6  ;(710)
0560 ;COLOR4 = $02C8  ;(712)
0570 CRSINH = $02F0
0580 CH1 =   $02F2
0590 CHREG = $02FC    ;(764)
0600 DSPFLG = $02FE
0610 CONSOL = $D01F
0620 IRQEN = $D20E
0630 PUTBYTES = $0B
0640 ;
0650 ;VECTORS
0660 ;-------
0670 ;
0680 COLDST = $0244
0690 KEYDEL = $02F1
0700 ;CIOV =  $E456
0710 WARMSV = $E474
0720 ;
0730 ;ZERO-PAGE 2-BYTE POINTERS
0740 ;-------------------------
0750 ;
0760 SCRPTR = $CB
0770 TXPTR = $CD
0780 ;
0790 ;KEYPRESS VALUES:
0800 ;---------------
0810 ;
0820 ;     CONSOLE KEYS
0830 ;
0840 SELECT = 5
0850 START = 6
0860 ;
0870 ;     ATASCII CHARACTERS
0880 ;
0890 SPACE = $20
0900 ;EOL =   $9B
0910 ;
0920 ;     CHREG VALUES
0930 ;
0940 NOKEY = $FF
0950 ;
0960 ;
0970      *=  $4000
0980 ;
0990 TOP
1000      CLC
1010      CLD
1020      JSR NOBREAK ; Disable BREAK
1030      LDA SAVMSC  ; Store start
1040      STA SCRPTR  ; adr of screen
1050      LDA SAVMSC+1 ;memory in ZPG
1060      STA SCRPTR+1 ;screen pointer
1070      JSR SETUP   ; Print opening
1080 ;                 message and
1090 ;                 wait for
1100 ;                 START keypress
1110 ;
1120 RESTART
1130      JSR NOBREAK ;Kill BREAK
1140      LDA #0      ;Turn cursor
1150      STA CRSINH  ;on, normal
1160      STA DSPFLG  ;CTRL chars
1170      STA COLOR4  ;Black border
1180      LDA #2      ;Left margin=2
1190      STA LMARGN
1200      STA COLOR2  ;Gray backgrnd
1210      LDA #$0A    ;White letters
1220      STA COLOR1
1230      LDX # <MAINSCRN ;Print the
1240      LDY # >MAINSCRN ;main scrn
1250      LDA #90
1260      JSR PRINT
1270      JSR OPENK   ;OPEN K:
1280      LDA #NOKEY  ;Clear key reg
1290      STA CHREG
1300      LDA #0      ;Clear Inverse
1310      STA INVFLG  ;lock.
1320      LDA #64     ;Set all CAPS
1330      STA SHFLOK
1340      JSR KEYCHK  ;Wait for key-
1350      JSR KEYIN   ;press & get key
1360      JSR CLOSE1  ;Close K:
1370      LDA CH1     ;Get last key
1380      STA KEYBUF  ;accepted &
1390 ;                 store it.
1400      JSR MAKEINT ;ATASCII code
1410 ;                 is converted
1420 ;                 to internal
1430 ;                 code and
1440 ;                 stored in
1450 ;                 INTBUF
1460      LDA KEYBUF  ;Recover
1470 ;                 keyboard code
1480      JSR MAKEDEC ;Convert to
1490 ;                 ATASCII digits
1500      LDY #2
1510 ;
1520 MOVKEYDEC
1530      LDA ATAHUNS,Y ;Move the
1540      STA KEYBDEC,Y ;result to
1550      DEY           ;  KEYBDEC
1560      BPL MOVKEYDEC
1570      LDA KEYBUF  ;Get keyboard
1580      JSR HEXCONV ;code and
1590      LDY #2      ;convert to HEX
1600 ;
1610 MOVKEYHEX
1620      LDA ATAHUNS,Y ;Move the
1630      STA KEYBHEX,Y ;result to
1640      DEY           ;  KEYBHEX
```

```
1650      BPL MOVKEYHEX
1660      LDA INTBUF  ;Get internal
1670      JSR MAKEDEC ;code & convert
1680      LDY #2      ;to ATASCII
1690 ;
1700 MOVHARDEC
1710      LDA ATAHUNS,Y ;Store the
1720      STA HARDDEC,Y ;result in
1730      DEY           ;  HARDDEC
1740      BPL MOVHARDEC
1750      LDA INTBUF  ;Get internal
1760      JSR HEXCONV ;code & convert
1770      LDY #2      ;TO HEX
1780 ;
1790 MOVHARDHEX
1800      LDA ATAHUNS,Y ;Move the
1810      STA HARDHEX,Y ;result to
1820      DEY           ;  HARDHEX
1830      BPL MOVHARDHEX
1840      LDA ATBUF   ;Get ATASCII
1850      JSR MAKEDEC ;charcode and
1860      LDY #2      ;convert to DEC
1870 ;
1880 MOVATDEC
1890      LDA ATAHUNS,Y ;Store the
1900      STA ATDEC,Y ;  result in
1910      DEY         ;  ATDEC
1920      BPL MOVATDEC
1930      LDA ATBUF   ;Get ATASCII
1940      JSR HEXCONV ;Convert to HEX
1950      LDY #2
1960 ;
1970 MOVATHEX
1980      LDA ATAHUNS,Y ;and store the
1990      STA ATHEX,Y ;result in ATHEX
2000      DEY
2010      BPL MOVATHEX
2020      LDA #1      ;Turn cursor off
2030      STA CRSINH
2040      LDX # <ATAMSG ;Print ATASCII
2050      LDY # >ATAMSG ;message
2060      LDA #ATALEN ;msg. length
2070      JSR PRINT
2080      LDA SAVMSC  ;Add $0170 to
2090      CLC         ;scrn ptr
2100      ADC #$70    ;low byte...
2110      STA SCRPTR
2120      LDA SAVMSC+1 ;high byte...
2130      ADC #1
2140      STA SCRPTR+1
2150      LDA INTBUF  ;Get char &
2160      LDY #0      ;poke it into
2170      STA (SCRPTR),Y ;scrn RAM
2180      LDX # <KEYMSG ;Print hard-
2190      LDY # >KEYMSG ;ware message
2200      LDA #KEYBLEN ;msg. length
2210      JSR PRINT
2220      JSR OPENK   ;Clear any
2230      LDA #NOKEY  ;keypresses...
2240      STA CHREG
2250      BNE QUITS?
2260 DONTQUIT
2270      JMP NOQUIT
2280 ;
2290 ; Is the user finished?
2300 ;
2310 QUITS?
2320      LDA CONSOL  ;Select press?
2330      CMP #SELECT
2340      BNE DONTQUIT ;Nope.
2350      LDX # <QUITMSG ;Yes!
2360      LDY # >QUITMSG ;Get user to
2370      LDA #QMSGLEN ;confirm.
2380      JSR PRINT
2390      JSR KEYCHK  ;Wait for key.
2400      JSR KEYIN   ;Get keypress.
2410      LDA ATBUF
2420      AND #$7F    ;ASCII only
2430      CMP #'Y     ;Was it "Y"?
2440      BEQ EXIT    ;Yupper!
2450      JSR SCRPUT  ;Nope.  Print it
2460      JSR CLOSE1
2470      LDA #EOL    ;Print an EOL
2480      JSR SCRPUT
2490      JSR GR.0    ;purify screen
2500      JMP RESTART ;and restart.
2510 ALLDONE?
2520      JMP QUITS?
2530 NOQUIT
2540      LDA CHREG   ;No...ANY key?
2550      CMP #NOKEY
2560      BEQ ALLDONE? ;No...
2570      JSR KEYIN   ;Yes!
2580      JSR CLOSE1  ;CLOSE K:
2590      LDA ATBUF   ;Print the
2600      JSR SCRPUT  ;key pressed
2610      JMP RESTART ;and restart.
2620 ;
2630 ; We're outa here.
2640 ;
2650 EXIT
2660      JSR SCRPUT  ;Print the key
2670      JSR CLOSE1  ;Close K:
2680      JSR CLOSE0  ;Close E:
2690      LDA #NOKEY  ;Clear CHREG
2700      STA CHREG
2710      LDA #$FF    ;Normal RESET
2720      STA WARMST  ;status.
2730      LDA #1      ;Tell OS disk
2740      STA BOOT?   ;boot was OK
2750      LDA #0      ;and no reboot
2760      STA COLDST  ;on warmstart.
2770      JSR GR.0    ;Purify screen.
2780      JMP WARMSV  ;Do warmstart.
2790 ;
2800 ;-------------------------------
2810 ;
2820 ; Subroutines -- what make the
2830 ; flow of the program work.
2840 ;
2850 ;-------------------------------
2860 ;
2870 ;This is a general purpose
2880 ;"Put bytes to E:"
2890 ;subroutine.
2900 ;
2910 ;Text address lo,hi is stored
2920 ;upon entry in x,y.
2930 ;Text length lo is stored
2940 ;in A.  Text length hi is
2950 ;always assumed to be zero.
2960 ;
2970 PRINT
2980      STX ICBAL   ;Adrlo=X
2990      LDX #0      ;IOCB#0 (E:)
3000      STA ICBLL,X ;Lenlo=A
3010      TXA         ;Lenhi=0
3020      STA ICBLH,X
3030      TYA         ;Adrhi=Y
3040      STA ICBAH,X
3050      LDA #PUTBYTES ;Put cmnd.
3060      STA ICCOM,X
3070      JSR CIOV
3080      JMP NOBREAK
3090 ;
3100 ;This subroutine prints the
3110 ;character stored in the
3120 ;accumulator to the screen.
3130 ;
3140 SCRPUT
3150      PHA         ;Save A Reg.
3160      LDX #0      ;IOCB #0
3170      TXA
3180      STA ICBLL,X ;LEN=0
3190      STA ICBLH,X
3200      LDA #PUTBYTES ;Put cmnd.
3210      STA ICCOM,X
3220      PLA         ;Restore A and
3230      JMP CIOV    ;print it.
3240 ;
3250 ; Do we or do we not have a
3260 ; keypress?  KEYCHK waits until
3270 ; we get one.
3280 ;
3290 KEYCHK
3300      LDA CHREG   ;Any keypress?
3310      CMP #NOKEY
3320      BEQ KEYCHK  ;Nope.
3330      RTS         ;Yep!
3340 ;
3350 ; We have a keypress.  Let's
3360 ; read it through IOCB #1.
3370 ; (where the keyboard happens
3380 ; to already be open!)
3390 ;
3400 KEYIN
3410      LDX #$10    ;IOCB #1
3420      LDA #7      ;Get bytes
3430      STA ICCOM,X
3440      LDA #1      ;Lenlo=1
3450      STA ICBLL,X
3460      LDA #0      ;Lenhi=0
3470      STA ICBLH,X
3480      LDA # <ATBUF ;Point to
3490      STA ICBAL,X ; ATBUF
3500      LDA # >ATBUF
3510      STA ICBAH,X
3520      JMP CIOV
3530 ;
3540 ; Open the keyboard.  Nothing
3550 ; visible happens, but you can
3560 ; read from the keyboard now.
3570 ;
3580 OPENK
3590       OPEN  1,4,0,"K:"
3600      RTS
3610 ;
3620 ; Close IOCB #1.  End-of-file.
3630 ; We got our keypress.  G'bye!
3640 ;
3650 CLOSE1
3660       CLOSE  1
3670      RTS
3680 ;
3690 ; Close IOCB #0.  We're exiting.
3700 ;
3710 CLOSE0
3720       CLOSE  0
3730      RTS
3740 ;
3750 ; Turn ATASCII keycode into
3760 ; hardware (internal) code
3770 ; and store the result in
3780 ; INTBUF.
3790 ;
3800 MAKEINT
3810      LDA ATBUF   ;Get ATASCII
3820      BMI FIXHI   ;If inv, fix.
3830 ;
3840 LOKEY
3850      CMP #32     ;Key>31?
3860      BCS MIDKEY  ;Yes.
3870      CLC         ;No - add 64.
3880      ADC #64
3890      STA INTBUF  ;Conversion
3900      RTS         ;complete.
3910 ;
3920 MIDKEY
3930      CMP #96     ;Key>95?
3940      BCS HIKEY   ;Yes - fix.
3950      SEC         ;No - subtract
3960      SBC #32     ;32 from key.
3970      STA INTBUF  ;Conversion
3980      RTS         ;complete.
3990 ;
4000 HIKEY
4010      CMP #128    ;Key>127?
4020      BCS FIXHI   ;Yes.
4030      STA INTBUF  ;No - conversion
4040      RTS         ;unnecessary.
4050 ;
4060 FIXHI
4070      AND #$7F    ;Clear bit 7
4080      JSR LOKEY   ;Go do usual
4090      ORA #$80    ;conversion,
4100      STA INTBUF  ;reset bit 7,
4110      RTS         ;and done.
4120 ;
4130 ; We don't want any BREAK errors
4140 ; crippling the program, so...
4150 ;
4160 NOBREAK
4170      LDA POKMSK  ;Disable the
4180      AND #$7F    ;BREAK key
4190      STA POKMSK
4200      STA IRQEN
4210      RTS
4220 ;
4230 ; We want a nice display for the
4240 ; user to look at, and we want
4250 ; the user to understand what is
4260 ; going on.  We'll dress up the
4270 ; screen a bit and print out our
4280 ; explanatory message.
4290 ;
4300 SETUP
4310      LDY #0      ;Black screen
4320      STY COLOR2  ;and border
4330      STY COLOR4
4340      LDA #10     ;White text
```

```
4350      STA COLOR1
4360      LDA # <INTROTX ;Point TXPTR
4370      STA TXPTR   ;   at INTROTX
4380      LDA # >INTROTX
4390      STA TXPTR+1
4400 ;
4410 FASTPRNT
4420      LDA (TXPTR),Y ;Get scrntext
4430      CMP #128      ;Last char?
4440      BEQ STARTPRS  ;Yes-chk START
4450      STA (SCRPTR),Y ;No, move
4460      INY           ;char to scrmem
4470      BNE FASTPRNT
4480      INC SCRPTR+1 ;Step up SCRPTR
4490      INC TXPTR+1 ; and TXPTR
4500      BNE FASTPRNT
4510 ;
4520 STARTPRS
4530      LDA CONSOL   ; START pressed?
4540      CMP #START
4550      BNE STARTPRS ;Nope!
4560      RTS          ; Yes!
4570 ;
4580 GR.0 ;            Keep the macro
4590      GRAPHICS  0 ;from needlessly
4600      RTS         ;being reassembled
4610 ;
4620 ;-------------------------------
4630 ;
4640 ; Buffers, text & storage space
4650 ;
4660 ;-------------------------------
4670 ;
4680 KEYBUF
4690      .DS 1
4700 INTBUF
4710      .DS 1
4720 ATBUF
4730      .DS 1
4740 ;
4750 MAINSCRN
4760      .BYTE 125,EOL,"Keycode
Getter",EOL
4770      .BYTE "Written by Bob Hardy
with MAC/65",EOL,EOL
4780      .BYTE "Press a key for which
you want codes:",EOL,EOL
4790 ATAMSG
4800      .BYTE EOL,EOL
4810      .BYTE "ATASCII:",EOL
4820      .BYTE "Char:     ",EOL
4830      .BYTE "Dec: "
4840 ;
4850 ATDEC
4860      .BYTE "      Hex: $"
4870 ;
4880 ATHEX
4890      .BYTE "    ",EOL,EOL
4900 ATALEN = *-ATAMSG
4910 ;
4920 KEYMSG
4930      .BYTE "Hardware code:",EOL
4940      .BYTE "Dec: "
4950 HARDDEC
4960      .BYTE "      Hex: $"
4970 ;
4980 HARDHEX
4990      .BYTE "    ",EOL,EOL
5000 ;
5010      .BYTE "Keyboard code:",EOL
5020      .BYTE "Dec: "
5030 ;
5040 KEYBDEC
5050      .BYTE "      Hex: $"
5060 ;
5070 KEYBHEX
5080      .BYTE "    ",EOL,EOL,EOL,EOL
5090      .BYTE "Press <RETURN> to
continue.",EOL
5100      .BYTE "Press <SELECT> to
exit.",EOL
5110 KEYBLEN = *-KEYMSG
5120 ;
5130 QUITMSG
5140      .BYTE 125,EOL,EOL
5150      .BYTE " QUIT  Keycode Getter?
(Y/N)",EOL,EOL
5160 QMSGLEN = *-QUITMSG
5170 ;
5180 ; Convert binary number to dec.
5190 ;
5200 MAKEDEC
5210      TAX           ;Save A in X
5220      LDA #0        ;Zero out all
5230      STA HUNS      ;the decimal
5240      STA TENS      ;counter regs.
5250      STA ONES
5260      LDY #2
5270      LDA #SPACE
5280 ;
5290 CLRLOOP
5300      STA ATAHUNS,Y ;Fill ATAHUNS
5310      DEY           ;with spaces
5320      BPL CLRLOOP
5330      TXA           ;Restore val A
5340 ;
5350 HUNTEST
5360      CMP #100      ;100 or more?
5370      BCC TENTEST ;No.
5380      SEC           ;Yes!
5390      SBC #100      ;Subtract 100
5400      INC HUNS      ;INC 100-counter
5410      JMP HUNTEST ;Try again
5420 ;
5430 TENTEST
5440      CMP #10       ;10 or more?
5450      BCC ONETEST ;No.
5460      SEC           ;Yes!
5470      SBC #10       ;Subtract 10
5480      INC TENS      ;INC 10-counter
5490      JMP TENTEST ;Try again
5500 ;
5510 ONETEST
5520      CMP #1        ;Done?
5530      BCC HUN2ATAS ;Yes!
5540      SEC           ;Nope.
5550      SBC #1        ;Subtract 1.
5560      INC ONES      ;INC 1-counter
5570      JMP ONETEST ;"1" more time!
5580 ;
5590 HUN2ATAS
5600      TAY           ;0 in Y
5610      LDA HUNS      ;Any hundreds?
5620      BEQ TEN2ATAS ;Nope.
5630      JSR MAKEATAS ;Yes, fix digit
5640      STA ATAHUNS,Y ;Store it
5650      INY
5660 ;
5670 TEN2ATAS
5680      LDA TENS      ;Convert tens
5690      JSR MAKEATAS
5700      STA ATAHUNS,Y ;Store it
5710      INY
5720      LDA ONES      ;Convert ones
5730      JSR MAKEATAS
5740      STA ATAHUNS,Y ;Store it
5750      RTS
5760 ;
5770 ; Turn reg. value into a digit.
5780 ;
5790 MAKEATAS
5800      CLC           ;Return ATASCII
5810      ADC #$30      ;numeral in ACC
5820      RTS
5830 ;
5840 ; Convert binary number to HEX.
5850 ;
5860 HEXCONV
5870      TAX           ;Save A in X
5880      LDY #2
5890      LDA #SPACE
5900 ;
5910 HEXHI
5920      STA ATAHUNS,Y ;Fill ATAHUNS
5930      DEY           ;with spaces
5940      BPL HEXHI
5950      TXA           ;Restore val A
5960      AND #$F0      ;Knock out lo
5970      ROR A         ;nybble...
5980      ROR A
5990      ROR A
6000      ROR A
6010      CMP #10       ;>9?
6020      BCC HEXLO     ;No.
6030      JSR FIXHEX    ;Yes!
6040 ;
6050 HEXLO
6060      JSR MAKEATAS ;Convert to
6070      STA ATAHUNS ; ATASCII...
6080      TXA
6090      AND #$0F      ;Knock out hi
6100      CMP #10       ;nybble...
6110      BCC HEXNOW    ;>9? No.
6120      JSR FIXHEX    ;Yes!
6130 ;
6140 HEXNOW
6150      JSR MAKEATAS ;Convert to
6160      STA ATATENS ; ATASCII and
6170      RTS           ; store result.
6180 ;
6190 FIXHEX
6200      CLC           ;Add 7 to turn
6210      ADC #7        ;10 into A,
6220      RTS           ;etc.
6230 ;
6240 INTROTX
6250      .SBYTE "
                 "
6260      .SBYTE "      Keycode Getter by
Bob Hardy          "
6270      .SBYTE "              Vers. 3.0
04/89              "
6280      .SBYTE "
                 "
6290      .SBYTE "      Not all key-
strokes will work with  "
6300      .SBYTE " Keycode Getter.  You
will not be able  "
6310      .SBYTE " to read CTRL-1, CTRL
4-9, CTRL-0,      "
6320      .SBYTE " Console keys or
BREAK.  You cannot      "
6330      .SBYTE " read the CTRL, SHIFT,
CAPS or Inverse   "
6340      .SBYTE " Keys when pressed
alone.  If you use    "
6350      .SBYTE " the CAPS or Inverse
keys, you must      "
6360      .SBYTE " press them AGAIN for
the next key.       "
6370      .SBYTE "
                 "
6380      .SBYTE "      Keyboard Codes
are not usually      "
6390      .SBYTE " needed.  You CAN find
many uses for     "
6400      .SBYTE " the ATASCII and Hard-
ware Codes in       "
6410      .SBYTE " BASIC or Assembler
programming.  If     "
6420      .SBYTE " you DO need Keyboard
Codes, remember   "
6430      .SBYTE " that the keyboard
doesn't distinguish  "
6440      .SBYTE " between caps and
lower-case keys, or    "
6450      .SBYTE " between normal and
inverse letters.      "
6460      .SBYTE "
                 "
6470      .SBYTE "
                 "
6480      .SBYTE "       Press <START> to
continue.          "
6490 ;
6500 ;...and a flag to show
6510 ;the end of the text...
6520 ;
6530      .BYTE 128
6540 ;
6550 KDEV
6560      .BYTE "K:",EOL
6570 ;
6580 ;ATASCII DECIMAL REGISTERS
6590 ;
6600 ATAHUNS .DS 1
6610 ATATENS .DS 1
6620 ATAONES .DS 1
6630 ;
6640 ;DECIMAL COUNTERS
6650 ;
6660 HUNS .DS 1
6670 TENS .DS 1
6680 ONES .DS 1
6690 ;
6700      *=  $02E0
6710      .WORD TOP
6720 ;
6730      .END
```

65816

More 65816 mutterings from Bob Woolley

I'd like to begin this month's discussion by reviewing what we will accomplish with this modification, what we won't, and what we can't. A number of 8-bitters have commented on the project, raising a few valid questions and concerns.

First, a clearer overview of the project:

This PBI hardware is designed to add additional computing power to your existing 8-bit Atari computer. MAJOR computing power. With a GR.0 screen, the 8-bit has approximately 20,000 CPU cycles to do things with during each video frame. This project adds an additional 210,000 CPU cycles to that capability. Along with the additional cycles, a 65816 also includes more efficient instructions and 16 bit operands. These two factors can result in a 2000% (20x) speed increase over the standard 1.79mhz 6502. This upgrade will increase the practical range of such tasks as image processing, page formatting, or data compression and probably represents the maximum resonable clock speed we will get on our Atari with current technology. Slower and more versatile methods may be employed to 'crank up the clock' - but that is not the focus of this hack. This is maximum overdrive. Kinder and gentler modifications will come later, OK?

What do we have to give up?

If we could construct a complete, new circuit board for the entire 8-bit computer, nothing would be lost in this upgrade. But, nobody could afford it. So....

Memory upgrades are out. We can't use any of the internal memory because we can't make it run at 14mhz. Maximum overdrive, remember? This does not preclude expanding memory past 64K (more on that later), but the DRAM bank selected, $D301 type upgrades are out for now. This is not so bad... Even the biggest, baddest IBM PCs cannot run main memory at 14mhz. A 66mhz IBM actually runs a small portion of its memory (the cache) at 33 mhz and pages (moves) data to and from main memory at 8mhz. Even the cache can't run at 66mhz - only the CPU internals can run that fast. Our AUX processor runs all of its memory at 14mhz. This means that a poorly written IBM routine (one that jumps all over main memory) will run slower on a 66mhz PC than on the upgraded Atari (actually, the 65816 executes many instructions in fewer cycles than the 80x86 devices - a 14mhz 65816 will run on par with a 25mhz 80x86 in many applications).

The old Atari hardware is not available to the AUX processor. This includes ANTIC/GTIA, PIA, POKEY, cartridge and the PBI buss. None of these chips will run faster than 1.79mhz anyway, and the existing 6502 will still retain full functions on the hardware (including the PBI). The shadow registers are available, of course. $2FC will show you the last keystroke and $2C4 will set playfield 0 color and lum, for example. You will be able to alter the display list at $230 from the AUX processor as well as write directly to the screen at ($58) just like you did from the 6502. Just be a lot faster.....

Without an active effort on your part, it will not add any capability to your machine. It does require that software be specifically targeted to run in the AUX processor. This does

not necessarily mean that code will have to be written for the 816. 6502 routines that do not use the hardware registers may well run without major modifications. All that is required is a CALLing code segment in the 6502 and parameter passing routines between the two CPUs. The AUX CPU has the option of using or not using the 6502s zero page and stack or any other memory. Existing code blocks (floating point math routines at $D800 - $DFFF come to mind) can be moved and run with a little effort. The AUX processor has access to ALL of the 6502 RAM as well as his own, independent 64K block.

What might we get (besides turbo speed)?

One very nice aspect of this hack is the utility of having interrupts handled by the existing 6502. This allows the 65816 to run a continuous routine without interruption - a necessity for high speed data transmission. Many devices (modems, floppy drives, video capture ADCs) have very little capacity for holding data as it is being read or written. A floppy, for instance, starts reading a sector of data from the diskette with only two bytes of storage. If you don't read the data from the controller by the time two bytes are waiting, the read fails with an overrun. What this means is that if you take an interrupt during a read or write (where the CPU has to stop what it is doing and service the interrupt), the current sector will have to be re-run. This requires you to wait until that sector spins around under the head again - 200ms. This makes for very slow floppy drives. When using a modem, even the IBM systems require special buffers to run at high speeds (over 9600 baud). Adding floppy controllers, serial ports and A/D or D/A converter chips to the AUX processor will not only allow very high speed operations, but the normal Atari interrupts for VBI, DLI and timers can still take place concurrently.

Consider the current SIO or PBI hardware. A 1050 is a 650x processor that runs a single floppy and communicates with the main CPU via the SIO. The 850 is a 650x processor that does serial and parallel transmissions, also communicating to the 6502 via SIO. Same for the P:R connection, the XF551 and most other SIO devices. With the AUX processor, all these operations can be handled at high speed with communication directly into memory. Even new functions can be implemented on the AUX processor, since it will be designed to seamlessly accept additional I/O chips. 80 column adaptors, A/D converters and SCSI interfaces fit into this category and present the only practical path for scanners and video capture devices (although the 8-bit has a low resolution display, it can certainly manipulate large graphic files as well as print them - even a high end PC does not have the resolution to display a full page 300 dpi laser image).

To work on large data objects may require much more than 128K of total memory. The current 20ns SRAM chips cost $20 each - a price that is low enough to allow 4 or more banks to be included in the upgrade. This would allow 512K or more of high speed memory to be accessed by the 65816 or even the 6502. It may even be possible to use the old $D301 control scheme for the 6502 while the 65816 will use all the SRAM memory directly.

OK, enough discussion. Where were we?

Fine Tooned Engineering has now made available a 65816 upgrade that plugs into your existing 8-bit (those with 6502C processors - CO14806). It runs at the same speed as the old 6502 and seems to run all the same software. Installation is as simple as unplugging your 6502 and inserting the new board. Almost all systems have socketed 6502s, so no soldering should be required (you 130XE folks get the short stick on this one). Once installed, the complete 65816 instruction set will be available to machine language programmers, including native mode and extended addressing (with no other changes, extended addressing is of little value, but a fairly simple external upgrade plugged into the PBI can provide useful extended memory space).

The new instructions

Many of the old instructions can be executed on 16 bit operands (ADC, LDA, PHA, etc.), but 16 bit operations require native mode which I will discuss later. The instructions I am going to outline are all available in 6502 emulation mode (you default to emulation mode after RESET). Just code them in!

STZ

How often do you want to load $00 into a memory location? Instead of LDA $00 and

STA $mmmm, you can now just STore Zero - STZ $mmmm. One step, no waiting, no alteration to the accumulator. Works in zero page, indexed and zero page indexed modes, too. Very cool.

TXY and TYX

I had to look this up. Hard to believe that it is only available on the 65816. Transfers the X index reg to the Y (TXY) or the Y index to X (TYX)

BRA

BRanch Always. No need to CLC and BCC LABEL or whatever. This is an unconditional branch. Need at least one in every program....

BRL

Ah.... first of the big time instructions. BRanch always Long. Know how you seem to be trying to do a relative branch just a teensy bit farther than allowed (more than 127 bytes away)? You used to have to 'land and refuel' to get where you wanted - sometimes more than once. BRL will unconditionally branch 32K from your instruction, forward or backward. No more error 10 on our ED/ASM! This instruction is eqivalent to a JuMP relative..... great for those relocatable routines.

XBA

The 65816 is a 16 bit CPU - which means that the internal data path (the X and Y regs and the accumulator) are 16 bits wide. In emulation (6502) mode, these registers are forced to use only 8 bits, but that does not mean that the accumulator is limited to only half of the register. The A register is the standard 8 bit accumulator. The B register is the 8 bit extention of the accumulator, making it 16 bits wide when in native (65816) mode. This B register can swap its contents with the A register using the XBA instruction. This is the only access to the B reg and would be useful when you want to save the value of A without throwing it on the stack or back into memory (I can already see where I could use this one...). XBA swaps the contents of B and A. Another XBA puts them back... Bubble sort, anyone?

LDA

LoaD Accumulator? Isn't that a 6502 instruction? Well,,, yes, it is. But, even though we are in emulator mode, we can use some of the 24 bit addressing found on the 65816. There are the Long addressing modes - those using 3 byte addresses which work even in emulation. This lets your 8-bit directly address 16 megabytes of memory. No setup is required. No control registers - zip. Just LDA $mmmmmm. Done. Even better, the program counter (where we get instructions rather than data) is also extended. You can JSL $mmmmmm. You do need to be careful, though. If you JMP up into bank 10, your interrupt is not going to know where you were executing (the stack and zero page stay in the first bank, however). These Long addressing modes work on a variety of istructions besides LDA and STA.

There are additional instructions that you can use on your 816, in fact, all opcodes are now significant - they all execute something. Anyone writing 65816 code needs to write to WDC for the 65816 data manual. Tell them Bob sent you....

Ok - lots of really neat new stuff in emulation mode. How about native (16 bit) mode? Well, one thing that happens to you in native mode is that the interrupt vectors get moved a little bit. You can't enter native mode without fixing that (and a few other OS problems....) Stay with emulation mode for the time being. Maybe some rugged soul will patch up the OS for us and then we'll all be able to run 16 bits, native.

So, what about the AUX processor?

At the moment, I am adding additional memory to the FTe 65816 processor. Using 4 SRAM chips, you have 512K of memory that can be directly addressed by the 65816 under the covers of your 8-bit. It is also arranged in a configuration that will be used concurrently with the AUX 65816 hanging out on the PBI. For those who may want just the memory and internal processor, you could use 512K SRAMs (when they are available) and have 2mb of storage.... Anyone planning on 14mhz in the AUX processor might want to keep it under half a meg. Too much loading (too many SRAM chips) may make the high speed CPU unreliable. This is a fairly simple hack - turn off internal memory with the -EXTSEL line and gate all EXTENB (which means we are accessing memory) to the correct SRAM bank. More on this next month....

Bob

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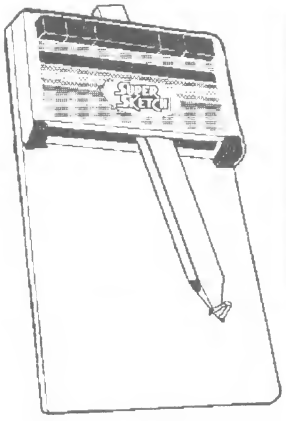

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ADVISORY!

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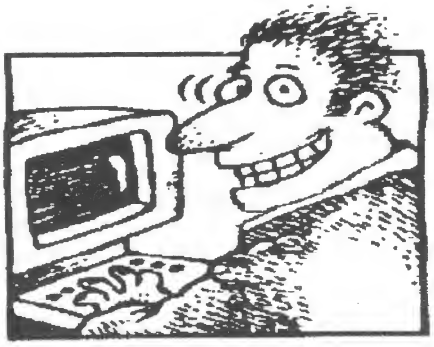

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TT TOUCH

Improve the feel of your 130XE keyboard with this welcome upgrade

BY JACK LEA

Atari made a fine computer when they made the 130XE -- YES, and NO. YES, the computer is the best 8-BIT computer there is. In fact it's my favorite model of the 8-BIT series, but when it comes to the keyboard the answer has to be NO. Whoever was in charge of the keyboard design failed to give it the crisp response you would expect from a keyboard. When you press the keys on the keyboard of the 130XE Computer it's like pressing down on mashed potatoes.I've been using my 130XE for sometime now but I just can't get use to the soft feel of the keys, especially after using the great keyboard of the 800XL. So one night after typing a long story for the FRANTIC Newsletter I had had enough of the missed keys and the unsure feel of the mushy keys on my 130XE. I remembered that Best Electronics (a mail order source for the Atari Computers in San Jose, California) had a keyboard upgrade for the 130XE in their catalog. So quick as a wink I sprang to my treasure chest, an old beat-up cedar chest. It is full of Atari magazines and other information that I have collected over the years on the Atari computers. I started looking in my cedar chest of magazines for my Best Catalog and sure enough there it was a loose leaf flyer sticking out of the pages of the catalog. The catalog flyer proudly stating, "Love your XE Computer? Hate your keyboard? Then have we got an answer for you". It's called the "TT" Touch.

RIGHT VERSION OF THE KEYBOARD

The flyer said that there were two versions of the keyboards for the 130XE computers but only one of the keyboards will accept the "TT" touch contacts. You can tell which version of keyboards will accept the "TT" touch contacts because it will not have a spring under the key caps. Also the off-white key plunger will be about a 1/4" in diameter with a locating pin at 12 and 6 o'clock positions on the inside of the plunger itself.

WHERE TO ORDER THE "TT" TOUCH

The article quoted a price of $29.95 + 4.00 postage for a total of $33.95 to be sent to BEST ELECTRONICS, 2021 The Alameda Suite 290, San Jose, CA. 95126. So off went my Winn Dixie Money Order to Best Electronics and in about a week and a half here comes a small package in the mail. I opened the brown envelope to find an even smaller plastic package inside containing little red Silicone pads. I don't know what I expected for my $33.95 but certainly some kind of hardware more impressing than this. The "TT" Touch is a bag of replacement silicone cups with a conductive disk in the center that makes contact with the printed circuit board (PCB). They were designed to provide more resistance and a crisp feel to the keys

PREPARE THE WORK AREA

"Oh well", I said to myself, "don't jump to conclusions just yet; if it does what it's suppose to do then it'll be well worth the price" .So I set about the task of installing the "TT" Touch contacts. First thing I did was to lay a towel, a couple of bowls, and two blocks of wood (1"x 2") on the kitchen table where I will be working on the computer. The bowls by the way will be for the parts that I take off the 130XE and for the parts that I will be replacing. The blocks of wood will be to support the computer up off the table, and the towel was to keep the screws and parts from rolling away. By the way the only tool that I will need for this upgrade is a #0 Phillips Screwdriver. The next thing I did was to read very carefully the brief instructions on the cardboard label that was attached to the plastic bag. Inside the plastic bag were 62 new and improved high grade red Silicone contacts. Sixty-two, that's great, that means there will be enough for Function Keys also.

INSTALLATION

I turned the computer upside down on the two supporting wooden blocks (disk boxes,

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SPECIAL NOTE Will Bill Kendrick (kendrick@vax.sonoma.edu) and Mr Slackey (slackey@lightstream.com) please get in touch with me at the above address with regards to the software we were discussing in June.

(TT Touch continued)

books, etc.) one on each edge, left and right of the keyboard. The reason for this is so the keys wont touch the table and thereby push the keys out of the keyboard when the computer is taken apart. With the computer in this position I used my #0 Phillips Screwdriver to remove the four screws that holds the computer case together. Then, I lifted up the back of the computer and carefully laid it over out of the way without removing the ribbon cable. Next, I unscrewed the eighteen screws from the metal backing plate. I lifted up the metal backing plate and the double layer of Mylar. * * Note * *, pay very close attention to how the double layer of Mylar is in place before you remove it. The Mylar has to be in the right position or the contacts will not make contact with the printed circuit board (PCB) * *. You will now see the old blue or green silicone contacts on the inside key plunger cavities. * * Note * *, at this point you might want to use a pair of tweezers to remove the blue or green contacts * *. It's nice that the contacts are two different colors; the old ones are blue or green, and the new ones that you will be putting in are red. Now, replace each one of the green or blue contacts with one of the New Red "TT" Touch contacts. Placing them in the round key plunger cavities with the black dot facing up at you. Now, reverse the procedure you used to disassemble the computer and -- Wah-la. You now have a keyboard that will give you the feeling of confidence that you need when typing.

RED FACED AND DOGHOUSED

Of course, this could never happen at YOUR house..... right?

BY JACK LEA

Sitting here looking at my reflection in the blank monitor screen. I can see my face turning red as I think about what happened last night. It all began when I and a few members of my user group, the A.C.F., began programming a special program to be sent by way of telecommunication to prospective new members. The program was to be an application form for membership into the A.C.F. (Atari Computer Federation).

We almost had the program finished when Henry, the owner of "Henry's Chicken Shack", where we have our monthly meeting in the back room, came to the doorway and said "I'm sorry boys but tonight you fellows are going to have to shut it down. I've got to go home early, some of my kinfolk are coming over to the house. "Oh man!!", we all said in unison "just one more hour". "No", came a determined reply while at the same time snatching the wet dish towel off of his heavy shoulder. Art Conrad, the president of our group, looked at each one of us and asked, "OK, any ideas what we should do now"? After a brief debate amongst our selves, no one came up with any ideas. So I said with bravado "Lets go to my house; we can finish the program on Oscar (the name for my beloved 1200XL computer)".

I think this group knows if they wait long enough without volunteering that I'll end up taking on the job that has to be done. So we packed up all our gear and took off into the night in the direction of my house in a dozen cars. I could see the neighbors porch lights all popping on as our cars pulled up in front of my house. I thought to myself this looks like a swat team pulling up in the middle of the night for a drug bust. I got out and waved to all the members to come on in and told them to make themselves at home.

While they settled down in the living room, on the couch and in chairs, I went into the kitchen for a round of Chex Diet cokes for everyone. After about 15 minutes Art said "H.J. (that's me, Hacker Jack), it's getting late. We better get started on that program before it gets any later". "Where's your computer gear setup at?", Art

said as he glanced about the living room. "Oh it's in the bedroom, ya'll come on back", I said as I started for the back bedroom. "Whoo, just a minute H.J. where's you wife at", Art said. Oh she's asleep but if we're careful we won't disturb her.

So with that they all looked at each other, shrugged their shoulders, and followed me into the bedroom. I stopped at the bedroom door and said in a low tone, "Shuu, now just let me open the door and check to make sure she's asleep". Doug, who was right behind me said, "What's that noise"? "Oh she sounds like that sometime when she first goes to sleep", I said in a reassuring way, "she'll stop after a while, ya'll come on in it's OK". "We made our way past the bed where the lamp on the night stand illuminated my sleeping princess while she laid there snoring .I sat down in my computer chair and booted up the program that we had been working on at Henry's Chicken Shack.

After about two more hours we all felt that the program was about as fine tuned as it was going to be. So I turned off the master switch on my console and powered down my 1200XL, and decided to call it a night. Bill, another group member, the one that I find hard to tolerate because of his pushy ways, reached to turn off the light at the same time as I was reaching to turn it off. It seemed like time stood still as I watched in horror while the lamp slowly fell off the desk top and crashed to the floor, exploding like a bomb going off. After that, everything seemed to happen so fast.

First whiskers, our cat, who had been peacefully sleeping at the foot of the bed sprang awake with a scream like an Irish Banshee with every hair standing on end. Jumped up and ran for the door. The poor animal was so frightened that it ran smack into the closed door, knocking itself out cold.

Then my wife woke up and that's when things took a turn for the worse. You see with the uneasy times we've been having in our nation, I had decided a few days ago I would go to George's pawn shop and purchase one of those new pepper spray cans that is suppose to be more powerful then Mace. I wanted the most bang for my bucks so I got the hiker and camper model. George said, "Boy this one will knock down a grizzly in his tracks at twenty feet". So naturally that's the one I got. Well anyway after my wife gave out with two hoots and a holler she reached for that pepper spray can and blasted away at all us intruders in her bedroom.

In the panic I forgot that I lived there and was just as big a hurry to get out of there as everyone else was. Red slimy mist swirled about our heads as my wife kept her finger hard on that spray can button. By the time we got out of that bedroom we couldn't see or breath. It sure seemed like a long, long way to that front door. We came out of that house like crazy men, which by then I think we were. We went off the porch, onto the lawn, fell on the ground.

We were rolling around all over the place trying to get a breath of fresh night air. My eyes were burning, my nose was running, my throat was burning, I couldn't see. I was now starting to hear a high pitched sound in my ears. Man how many different effects does this pepper gas cause a person. The next thing I knew some kind soul was helping me to my feet, and that's when I realized what that high pitched sound was. It was police sirens. The neighbors had called the police when they had heard all those screams and hollows in the middle of the night, and that kind soul that was helping me up turned out to be one big policeman.

I finally managed to explain to the officials what had happened and they let us go with a stiff fine for disturbing the peace. I'm now doing my computing out here in the tool shed with Mojo, our dog, he seems to be happy I'm out here with him. Uh, am glad some body's glad I'm around. I wonder If after this incident if I'm still in the computer club; uh, I wonder if I'm still married.

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DUE: MAY 1

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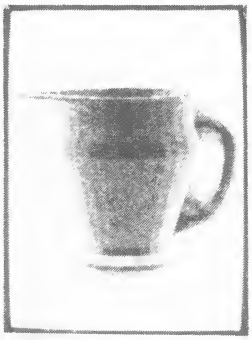
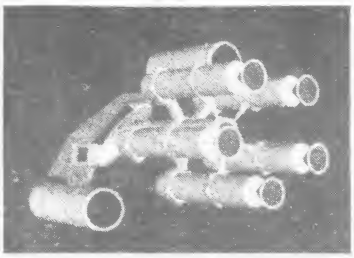
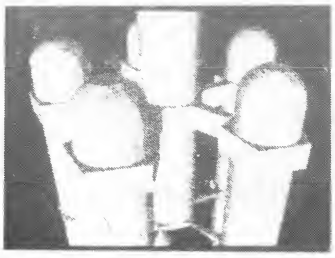


Same Pitcher ,rendered by SURFACE SHADER (TV Screen Photo)



Space ship, 5 cluster rockets (TV Screen Photo)



Close up of cluster rockets from the top (TV Screen Photo)

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With the ChromaCAD™ MODEL BUILDER program, you can build any 3-D Model you can dream of. You merely start at the bottom and draw the contour lines of the model as you work your way up. Add surface colors to the model as you draw the lines. *You* decide how many contour lines to use for each model (up to 158). Huge scrolling graph allows you to draw contour lines *as detailed as you want.* Computer-assisted drawing of lines, circles, arcs, ellipses.

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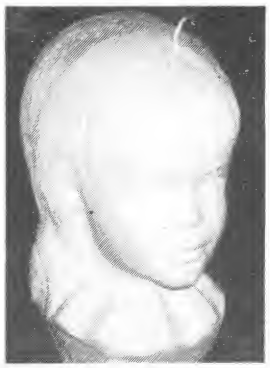

Photo of actual bust of human head

3-D model rendering (TV Screen Photo)

3-D Model Rendering (TV Screen Photo)

3-D Model Rendering (TV Screen Photo)